RELATION
OF
PSYCHOLOGY TO MUSIC

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RELATION

OF

PSYCHOLOGY TO MUSIC

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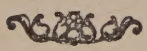

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TO

MY PUPILS,

WHOSE FAITHFULNESS AND MANIFEST APPRECIATION
HAVE INSPIRED CHEER AND ENCOURAGEMENT IN MY LABORS,
THIS VOLUME IS LOVINGLY DEDICATED.

THE AUTHOR.

PREFACE.

The "Relation of Psychology to Music" was first published in 1899. It was then considered somewhat of an experiment. The result was such as to surpass all expectations of both author and publishers. Encouraged by the favorable reception with which it has met and by the many enthusiastic expressions of appreciation of its merits and value, the author herewith gives forth a new, revised and stereotyped edition.

This volume consists of lectures delivered to the pupils and faculty of the Augustana Conservatory of Music, Rock Island, Ill, during the years 1897 to 1899. At the request of the pupils and numerous friends these lectures are here given in the form in which they were delivered. This book is not designed to be an exhaustive treatise on psychology, but its object is to *apply* some of the principles of psychology to the study of music. The author freely acknowledges his indebtedness to various works for suggestions, illustrations, etc.; especially those of James, Halleck, Lindner, Davis, Mertz, Tapper and Gates, to which, with others, reference is made in foot notes. The numerous quotations are designed for illustration and for bringing together in topical connection the utterances of various authorities, thus greatly enhancing the value of the work to students. "The Relation of Psychology to Music" is, however, a new subject, and opens up an exceedingly interesting and important field for investigation. The questions at the end of each chapter are added to aid students in preparing for examination on the principles of psychology, where such examination is required, and also to aid the general reader in fixing attention upon the subject matter of the treatise. With the hope that music students

in particular and all lovers of music in general, by the perusal of these pages may be stimulated to a better appreciation of musical science and art, and may receive some suggestions which shall be of value in the pursuit of their studies, this volume is given to the public.

E. F. BARTHOLOMEW.

Rock Island, Ill., Jan. 1, 1903.

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INTRODUCTION.

In recent years a new movement has sprung up in the musical world. A quiet but far reaching revolution in methods of studying and teaching music is now going on. This movement is not superficial and temporary: it grows out of fundamental principles. A new conception of musical art is working its way into the popular mind and is rapidly transforming the current notions about musical education. Only a few years ago harmony and perhaps a glance at counterpoint were considered quite enough for the average student; anything more was considered a mere accomplishment, not a necessary part of a musical education. Even yet to a certain extent harmony is a sealed book, not only to the majority of advanced pupils, but even to many teachers.

Progress in musical education has lagged behind chiefly on account of two extreme and radically wrong views as to the nature of music: first, that music is almost exclusively a matter of practice, and secondly, that it belongs to the realm of *pure genius*, in which no rules and principles are to be recognized. But music, on the one hand, is more than practice, more than finger-gymnastics; on the other hand, it is not the exclusive prerogative of so-called *genius*, whatever that may mean—music may be cultivated by those who are not *geniuses* in the proper sense of that word. It is a great mistake to suppose that the ability to read notes, together with a certain amount of vocal and digital skill, constitutes a musical education. According to the present conception, a musical

education includes a fair degree of acquaintance with numerous other allied subjects, such as aesthetics, acoustics, physiology, literature, history of music, biography, in short, all the numerous elements relating to music both as a science and as an art, both theoretical and practical. A well taught music pupil must know not only how to read well, to finger correctly, and even to play a modern sonata or fantasia with a degree of artistic skill, but he must also have a sufficiently broad and thorough general culture to enable him to judge correctly concerning the ethical and aesthetical meaning of the compositions he plays. Not only the fingers and hands and voice, but also the *mind* must be well trained. There is a demand for a broader intellectual foundation for the study of music. The expansive and strengthening and sharpening influence of knowledge is needed quite as much for the calling of a musician as for any other calling. Whatever adds to our general power of efficiency, adds just so much to our musical ability and resources.

In regard to methods of teaching music, the change now going on is just as radical. Many of the old ways and ideas are discarded, not only because they are found wanting, but because they are positively vicious as being contrary to the nature of mind as well as of muscles and nerves. The demand of the present is that methods of music teaching be based on sound pedagogical and rational principles. This movement in regard to musical education is only part of a much broader movement in general education, for musical education rests on the same principles as any other branch of education.

What has brought about the change of which we

speak? Chiefly, *the study of psychology.* Psychology is now regarded as the fundamental science, the science which must shape the methods of studying and teaching every other subject. Correct scientific knowledge of the mind and of its several modes of activity, together with knowledge of the nervous system, is at the bottom of everything pertaining to methods and substance of educational work.

Teaching became a science and assumed a normal and rational form only as psychology furnished the motive and prepared the way. Pedagogical science rests on knowledge of the mind, whether applied to the learning or the teaching of subjects. In recent days it has come to be understood that psychology stands in most important relation to music and the study of music. The subject is rapidly growing into favor among music students and teachers all over the country, as may easily be inferred from the current musical literature. The signs of the times indicate that along this line are to be achieved the best results of progress for the years to come. Psychology is gradually making its way into the conservatories of the country and is rapidly transforming the traditional courses of study and methods of teaching.

QUESTIONS.

1. What new movement in the musical world?
2. From what has this movement sprung?
3. Why has progress in musical education lagged behind?
4. Describe the new conception of musical education.
5. What is said of methods of teaching music?
6. What has the study of psychology effected?
7. Why is the study of psychology important to the music student?

CHAPTER I.

The Nature of Music.

THE design of this chapter is to gain an advantageous point of outlook for our subject. In order to discuss the relation of psychology to music the two related things must be separately brought into view, especially those aspects of them which have manifest reciprocal bearings. As our subject is mainly philosophical in its nature and principles, we must bring into view the philosophical side of music. Though philosophical in its principles, our subject is yet profoundly simple and eminently practical. It is not something so lofty that only the learned can understand it, but if rightly presented it comes home to the comprehension of the common people.

Hitherto comparatively little progress has been made along the line of scientific investigation of the nature of music. Even in our day music can hardly be said to be grounded on a scientific basis, for it has not wholly passed out of its mystical stage. For this slow progress various reasons may be given, which it is not necessary here to explain in detail. In general, it may be said that music is one of the latest of the arts to develop. For a long time it stood apart from the other related arts as if, like religion, it was considered too sacred to be subjected to the rude process of analysis. Then, too, music has been imagined to belong to the transcendental realm of genius, in which

ordinary scientific principles are supposed to have only doubtful application. The art side of music has been unduly exalted to the detriment of the science side. But a true philosophy recognizes the fact that every true art must rest on a basis of science, and without this basis of science there can be no real progress in art. Musical art is not an exception: it rests on a musical science just as truly as the art of surgery rests on the science of anatomy and physiology. To ignore this simple principle is to envelop the true nature of music in clouds of mist or to plunge it into the chaotic deep of ignorance and superstition. To this must be added that the old traditional view has made everything of the outward mechanical side of music and has utterly neglected the inward psychological and thought element.

Surrounded thus by prejudices and fettered by traditional misconceptions, it is not strange that music has lagged behind in scientific development. When it shall have been freed from its grave-bands of mediaeval mysticism, it will rise into a new life and will go forward into a greater field of usefulness. In recent times science has dared to lay its profane hands upon the sacred subject of music, and now insists upon applying its methods of analysis and synthesis, of observation and experiment, of comparison and induction to matters which before were supposed to transcend all such tests. The result is that the nature of music is better understood now than ever before, and, instead of being the exclusive possession of a favored few, music has been brought down from its airy height to the homes and business of the common people.

Musical Phenomena. — To-day music has its phenomena just as any other subject of investigation, and these phenomena are not considered inscrutable mysteries but capable of scientific explanation. The various facts about music, in so far as they are facts of observation, have their *causes* just as truly as the facts of nature and of common experience; these causes can be studied and accurately ascertained. Music has its fixed principles and laws, which, when known, can be applied to the making of improvements in the art, both in relation to theory and to practice. For example, we all know that a *major* chord and a *minor* chord do not affect the ear in the same way nor do they awaken the same kind of feeling; it is no mystery but an explainable phenomenon.

The *major* keys are generally adapted to sentiments of gayety, pleasure, contentment, while the *minor* keys are suited to the expression of sorrow, pity, fear, melancholy, pathos, etc. Grétry, in his "Essays in Music," says: "The key of C major is noble and frank, that of C minor is pathetic. The key of D major is brilliant, that of D minor is melancholy. The key of E flat is grand and also pathetic; it is a semitone higher than D major, and still does not in the least resemble it. By ascending again a semitone, we reach the key of E major, which is as sparkling as the preceding one was grand and melancholy. The key of E minor is rather sad, although it is the first minor scale in nature; that of F major is mixed; that of F minor is the most pathetic of all; the key of F sharp major is hard and sharp, because it is overloaded with accidentals; the key of G major is warlike and not as grand as C major; the key of G minor is the most pathetic, except that of F minor. The key of

A major is very brilliant; that of A minor is the simplest, least brilliant of all. The key of B flat is grand, but less so than C major, and more pathetic than F major; B major is brilliant and gay, while B minor is adapted to express sincerity and artlessness." In general, all the minor keys are tinged with melancholy and sadness, while the major keys are brilliant and lively. It appears thus that each key has its special character and awakens emotions peculiar to itself. This fact rests on a scientific ground and may be satisfactorily explained.

What has been said of the several keys, may also be said of the various musical instruments. In addition to the *timbre* of the sounds produced by the various instruments, all of which the physicist has carefully analyzed, there is a deeper and more subtle difference between them. Each kind of instrument has its definite *character*, just as persons have their particular character by which one differs from another. Says Chomet: "The bassoon is mournful; consequently it should be employed in expressing sorrow and pathos. The clarionet is suitable for the expression of grief; and if it is used for rendering merry music, the same is sure to be tinged with sadness. . . . The flute is sweet and tender; it is best adapted to express the sweet delight of a happy and tranquil lover. The trombone is sweet and harrowing. The trumpet excites frenzy and martial ardor. The violin seems suited to express all the sentiments common to humanity, but the viola ought to be reserved for songs of a tender melancholy." The guitar is plaintive and soothing; the drum and fife are rousing and warlike. Milton, the poet, philosopher, and musician that he was, has given us a striking example of the

facts under consideration in his "Paradise Lost." Of the fiends arrayed in martial order on the burning plains of hell regions, he says:

"Anon they move
In perfect phalanx to the Dorian mood
Of flutes and soft recorders; such as raised
To height of noblest tempers heroes old
Arming to battle, and instead of rage
Deliberate valor breathed, firm, and unmoved
With dread of death to flight or foul retreat;
Nor wanting power to mitigate and swage
With solemn touches troubled thoughts, and chase
Anguish and doubt and fear and sorrow and pain
From mortal or immortal minds. Thus they,
Breathing united force with fixed thought,
Moved on in silence to soft pipes that charmed
Their painful steps over the burnt soil."

—Bk. I, 549—562.

The "Dorian mood" here referred to was serious and grave, as the Lydian was soft and the Phrygian sprightly. Manifestly the Phrygian mood would have been incongruous to the place and spirit of the occasion, and the poet's delicate sense of propriety does not allow his pen to make such a blunder. The Dorian mode was the first of the "Authentic" church modes or tones. Many of the old German chorales were written in this mode, such as "Vater Unser," "Wir glauben Alle," "Christ unser Herr zum Jordan kam," etc. For longer compositions in this mode, see Orlando Lasso's 5-part motet, "Animam meam," and the fugue in Bach's "Toccata." It is related that Pythagoras, seeing a young man transported with rage and on the point of destroying his faithless mistress, begged a musician to play some air in the Dorian mode. Thereupon the anger and excitement of the betrayed lover gave place to the most perfect calm-

ness, and he renounced all plans of revenge. We can easily imagine that when David played on his harp to soothe the frenzied spirit of king Saul, he played in the Dorian mode.

The foregoing facts are only a few examples of musical phenomena. There are discoverable reasons why the quality and spirit of music in one key differ from those in another key. The effects of the several keys on the mind are psychological phenomena and are capable of analysis and explanation. Here is open a wide and wonderfully rich field for investigation which when fully explored must yield valuable results in various practical directions. Psychology must lead the way in these investigations; psychology alone can furnish the key for unlocking these hidden treasures.

From such a point of outlook and with such a background to our subject, we approach the question,

What is the Nature of Music? Two general classes of views may be noted, namely, the subjective and objective, music as *idea* and music as *form*. But these in their bare statement are of little scientific value, and evidently are not sufficient; something deeper, more definite, more scientific is demanded by the student of to-day.

In a question of this kind the true mode of procedure is manifestly not dogmatic statement of opinion but analysis and induction. Analysis of the musical consciousness reveals the fact that our musical sensations are complex in their nature, bodily process being blended with mental processes.

The Physiological Element. In all music there is present a physiological element. Music stands partly in

sound sensation. To this corresponds the auditory apparatus,—external and internal ear—the "harp of a thousand strings," or rather, ten thousand strings. External sound waves act as stimuli to the sensitive auditory nerve which conveys these effects inward to the brain hemispheres, where somehow the physical vibrations are transformed into sensations of musical sounds or of noises. So far the process has a physiological basis. To this may be added the pleasurable effect of musical notes. Pleasure in musical notes is a fact of universal experience. Children, it is said, have been known to manifest distinct pleasure on hearing music as early as the tenth day after birth. This is perhaps wholly a physiological effect, due to rhythm. The baby finds delight in rhythmical noises; so the savage, in the sounds produced by his rude instruments. The rhythmical movements of the feet or fingers, e. g., in the act of imitating the sound of the millstone, produce a pleasurable effect. To this class of effects belongs the fascination of the dance, due partly to auditory and partly to optical rhythm. In all these cases the agreeable effect depends largely, perhaps entirely, on the rhythmical succession of sounds as perceived by the ear, and not on any mental analysis of the sounds giving certain rational or moral qualities, as in the case of the higher musical tones, e. g., those of the piano string, organ pipe, human voice, etc.

The Form Theory. The Herbartian school of psychology seeks to reduce all musical experience to *form*. The *formal* part is the *real* part of music. This formal part consists not of the mental product, but of the elementary nature of tones as determined by the excitement of the nerves. The charm of sound, the sen-

sation it excites in us,—this, they say, constitutes the essential subject matter in every piece of musical art. Of course this theory grounds the musical effects of sounds essentially in physiology. If it does not leave the mind of the artist entirely out of consideration, it at least crowds *mind* or the *thought-factor* in music so far into the background as to have very little value, relatively speaking. It does not sufficiently recognize that *ideal* element which we think and shall try to show later on, constitutes the deeper, the residual, the essentially aesthetic factor in all of the best music in the world. The form theory says in substance that *finger-music* is everything and *soul-music* is nothing. But the common sense of mankind will not accept this as true. The fact is that the physiological element is not the whole of sound-experience; there is something higher in musical sounds than mere sensuous delight. The pleasure of music is not all in the ear, any more than the beauty of a landscape is all in the eye. We can never explain Beethoven's ninth symphony by saying that it is nothing more than the excitement of our nervous system by means of external sound waves. Did Haydn think that the charm and beauty and power of his great masterpiece, the "Creation," consisted in nothing else than nerve excitation? That is not what we would infer from his utterance when, in the great hall of the University of Vienna where, on March 7, 1808, in the presence of the author, the immortal production was performed, pointing towards heaven and with tearful eyes he exclaimed, "It comes from there!" Did he think the music of his oratorio came from his fingers or from his soul?

The Spiritual or Psychic Element. Music consists of more than sense excitation; there is present a deeper spiritual element, which gives it its true character.

Helmholtz says: "We have to distinguish between the material ear of the body and the spiritual ear of the mind." Music in its highest qualities "proceeds from a spiritual source and addresses itself to the 'spiritual ear.'" Music is preeminently the art of the intellect, though not generally so regarded. Its true substance is *thought*, and not mere sensuous excitement. Music is deeply rooted in the aesthetic nature of the soul. "Without mental activity no aesthetic enjoyment is possible," for the aesthetic emotions are results of intellectual activity. The spiritual element is farther evident from the presence and influence of an absolute *ideal* in musical art. All great musical artists agree that there is present in music, just as in poetry, painting, sculpture, etc., an absolute *ideal* according to which their compositions take shape. Some one has said, "Music is architectural," that is, it consists in a process of construction according to an ideal. Music may be regarded as the expression of our ideal strivings after a fuller knowledge of the reality of spiritual being in nature. Musical art presupposes the existence of a Being in whom all the ideal strivings of the artist's soul after perfect beauty are realized.

The spiritual element is the most important part—the soul of music. It is this that makes it such a mighty power in the world.

As Congreve sings:

> "Music hath charms to soothe a savage breast,
> To soften rocks, or bend a knotted oak;
> I've read that things inanimate have moved

And, as with living souls, have been informed,
By magic numbers and persuasive sound."

Ancient mythology is full of references to the marvelous power of music. Apollo soothed the vigilant Argus to sleep with his lyre. Orpheus, by his song and the tones of his lyre tamed the fierceness of beasts, moved rocks and trees, lulled to sleep Cerberus, the watch dog of hell, charmed the evil spirits of Hades, etc. Amphion built the walls of Thebes by the magical power of his lyre. When he played the stones moved and voluntarily formed themselves into walls and turrets. What did the ancients mean by these myths and stories? They meant the power of mind and heart, expressed through musical sound, over the lower orders of existence—it is their way of saying that thought and will-power dominate the world.

Audible sound, i. e., the outward form, is not an absolute necessity of music. Beethoven, who became deaf at the age of thirty, could hear only the music of the heart. Though his outward ear was closed and no sounds from without could invade his inner auditorium, his "spiritual ear" was wonderfully acute. "What soul-music must he have heard as he wandered lonely through fields and valleys, with no sound from the outer world to disturb the music within!"

Says Dr. Mertz: "The great tone masters were men of noble souls; they were endowed with deep emotional natures; hence it is that their music lifts us up to a higher sphere as we listen to the beatings of their own hearts. . . . If, then, the masters wrote from the heart, if they heard much silent music within, which they wrote down for us, those who aim to perform it must in like manner sing and play with the best powers of their hearts and minds. . . . Every student

should aim at this power of reproducing the true heart music as it lies hidden in the notes. . . Music has a higher mission than merely to please the ear. It is the art which appeals most powerfully to the heart, and through this affects our characters. The idea that music has no higher influences than simply to produce, for the time being, pleasant sensations, has done much harm to the progress of the art, in schools as among the people, for it has caused many thinking men to regard music with a degree of suspicion. We must aim to be intelligent students; we must strive to see more in music than mere pleasurable sensations; we should study it as an art, hence we must become artists; that is, we must be imbued with the highest love for and the best understanding of what we study. To make it a refining, elevating medium, we must not merely be players and singers, but also art students; we must strive to become thinking as well as feeling musicians."

All these remarks powerfully emphasize the intellectual and spiritual element in music. Music, that is, in outward form, is the natural language through which the thoughts and feelings of the soul express themselves. Language has value only as it serves to express ideas. Music is a universal language, the language of the brotherhood of mankind. It is the only language which all souls can understand, even though their tongues differ, it is the true world-language. Through this medium soul holds fellowship with soul the world over. Music expresses more than words; in fact, where words fail, the full meaning of music only begins. Says Wagner: "The tone-language is the beginning and the end of the intellect, just as the

myth is the beginning and the end of history, and the lyre the beginning and end of poetry."

"That would indeed be a small art that gives us only sounds and no language, no expressions for the conditions of the soul" (Schumann).

The best music creates the necessity for mental activity, because music in its right conception is essentially an interpretation of the mind's ideas, emotions, and volitions. "The works of Beethoven are the stored-up result of all the individual heart-beats, all the individual acts of memory, all the glorious pangs of feeling, all the efforts of rational will, which passed through the consciousness of Beethoven in the course of his life." Music tells us far more than the heart can take in, hence the art is inexhaustible; the deeper we study, the more music reveals to us. A grand musical composition expresses the composer's inner life far better than could the best biography. Through his works we are made partakers of his greatest joys and deepest sorrows, and on the pinions of his inspirations we rise to heights we never reached before.

Music is first a Conception. The preceding reflections have led up to the conclusion that music is first and in its deepest root a conception of the soul, a movement of the spirit. The formal part of music is therefore secondary; it has to do with expression and is largely mechanical, just as language has for its office the expression of ideas through outward symbols. As there must be a root before there can be development into trunk, branches, leaves and fruit, so there must be an ideal conception before there can be an outward form of musical composition. A musical product is not essentially different from any other art product.

The painter, for example, has first an ideal conception of his masterpiece and then he proceeds to express that conception in outward form; so also the sculptor, the architect, the poet. Music does not start in the finger tips and make its way up into the brain; it starts in the soul and flows down and out through the fingers. All this means that the intellectual or conceptual element in music should receive the first and greatest amount of attention on the part of the student. As music is primarily a product of mental activity, its phenomena belong to the realm of psychology and psychology must give laws and principles for the study of music.

QUESTIONS.

1. Design of this chapter?
2. How account for the little progress hitherto made in our subject?
3. What is said about musical phenomena?
4. Name facts about the several keys.
5. Name facts about the various musical instruments.
6. Describe nature of the "Dorian mood." What has been made of it?
7. Are these phenomena explicable, and how?
8. Two general views about the nature of music?
9. Explain the physiological element in the musical consciousness.
10. How early in childhood does musical perception begin?
11. What is said of rhythm in this connection?
12. Explain the Herbartian form theory.
13. What objections to this theory?
14. Incident about the rendition of Haydn's "Creation," and what does it teach?

15. What is said of the spiritual element in music?
16. Give Helmholt'z remark about the "spiritual ear."
17. What is the *ideal* in music?
18. Examples from Mythology, illustrating the power of music.
19. What was the meaning of the ancients in these myths?
20. What says Dr. Mertz about the great tone masters?
21. What of music as a language?
22. Show that the thought element in music is of primary importance.
23. Explain statement that music is first a conception.
24. What conclusion follows from these considerations?

CHAPTER II.

The Psychological Character of Music Study.

AT the close of the preceding chapter we said that psychology must give laws and principles for the study of music. This is a very significant statement, and claims our further attention in the present chapter. If music in its root idea is a matter of thought, that is, if it is first a conception of the soul, then it follows that the study of music has to do primarily with the operations of the soul. Hence music study must begin with the study of mind. All foundational work, for example, in piano study, resolves itself essentially into an analysis of those initial mental states which give rise to the various finger movements in technique as well as to the higher things of expression and interpretation. If the history of a given piece of music from its origin in the mind of the composer through all its stages of elaboration to its execution and interpretation by some master artist could be fully written, we should find that such a history is simply a series of correlated mental processes. In matters of technique it is an observed fact that accurate and rapid finger movements can be acquired best by focusing the attention upon the position and condition of the different organs concerned. It is in reality the *brain* that plays, and not the fingers simply. The rapid and intricate finger movements of the skilful virtuoso are nothing else than brain action originated and directed by thought, and rendered

automatic by habit. The study of technique is thus fundamentally a study of brain and of thought processes. Consequently, if our methods of studying and teaching the piano are to be rational and normal, they must begin with the study of mind.

Again, expression in playing is manifestly only the outward sensuous side of an inward mental conception. Before there can be any expression, there must be a certain state of thought and emotion to express or force into outward form. The conditions for a full, free, and adequate expression are all determined primarily by mental states. If a player is master of his mental states, he will acquire an easy mastery of his favorite instrument, so that it will yield up at his command and give forth in perfect tones the elements of beauty and power contained in his lovely tone-conceptions. If expression means the giving forth of the *spirit* of music, as opposed to the mere mechanical production of sound, it must rest upon the laws of mind as foundation. Consequently, the teaching of expression must be preceded by a mastery of the principles of mind and of the processes of mental action. Those subtle elements in a musical performance which make possible a clear and effective presentation of the emotional and intellectual content of a work, can be mastered only by a practical acquaintance with the operations of thought. "For what man knoweth the things of a man, save the spirit of man which is in him?" It requires the exercise of mind to grasp and present correctly, what mind has conceived.

So also, when we proceed to the highest function of musical art, namely, interpretation, we find that the same principles obtain. Interpretation deals with the

thought content of a musical composition. The office of the interpreter is to represent in tone and action the meaning of the composer, to reproduce the beautiful tone-imagery which occupied the mind of the composer at the time when the piece was written. From a thorough study of the nature and meaning of a work the interpreter must first form a correct mind-picture of it, and then by means of tones set forth that picture to the apprehension of the listener. From all this we can see how much interpretation has to do with mind. The study of interpretation is a study of mind. How any one can teach interpretation without constant reference to the laws of thought under which the compositions he deals with took organic form, is hard to understand. If I am asked to explain the meaning of a rose, I know no better way to proceed than to analyze the rose, and by a careful study of the elements which I find, build up an intelligent conception of the organic processes by which the rose grew into its given form. Or, if I undertake to explain a masterpiece of poetry or oratory, I must set forth the way in which the masterpiece was produced. In each case the process involved is essentially psychological; *thought* is the great thing needful, and without thought but little progress can be made. Perhaps, in very rare cases, a musician may grasp the meaning of a piece *intuitively*, that is, *immediately*, without the conscious and laborious processes of analysis and synthesis; but surely this is the exception, and only serves to prove the rule. The rule among common people is that the meaning of a composition must be mastered by study. The learner must thread his way back from the finished product to its inception in the

composer's mind in the same line along which the writer proceeded in the making of the piece. When in this way the player is able to put himself into the composer's view-point and see the piece as the author saw it, he is in a condition to interpret correctly. It matters little how great technical skill he may possess, or how perfect control he may have of himself, or how thoroughly he may understand his instrument, he cannot interpret correctly unless he has mastered the composer's thought. The art of interpretation is but another name for the art of thinking. How preposterous for a beginner, who has not yet learned the art of thinking, to undertake to interpret the compositions of Beethoven or Bach! How much better and how much more sensible it would be if the beginner had the humility and patience to confine himself to the rudiments of technique and to the study of muscles and nerves and mind, before he dares even to lift his eyes unto the heaven of expression and interpretation!

QUESTIONS.

1. With what must music study begin?
2. What influence has mind on accuracy and rapidity of finger movements?
3. How is the study of technique a study of mind?
4. What is the relation of musical expression to mental states?
5. Why is the study of mind necessary for musical interpretation?
6. How explain a rose or masterpiece of literature?
7. To what should the beginner confine himself, and why?

CHAPTER III.

The Musical Faculty.

IT is important to have a right conception of a mental faculty. Erroneous views formerly held in regard to the nature of the mental faculties have given rise to mischievous psychological doctrines, the influence of which still lingers. Faculties were considered as integral parts of one whole soul, as, e. g., the different rooms in a house; the parts of a watch or steam engine; the keys, pipes, etc., of an organ; the various departments of the body-politic. Faculties have also been regarded as separate and distinct organs of a mental organism, as, e. g., the organs of the human body, such as the heart, lungs, stomach, brain, etc., each being a complete machine, as it were, within a machine. Then, too, faculties have been spoken of as distinct agents within us, which have their respective provinces and authority, which command, obey, and perform various acts, as so many separate beings.

These views are all erroneous and prejudicial to the progress of psychological science. Even as illustrations they serve a vicious purpose. We must frame our definition of a mental faculty upon the basis of the absolute unity and indivisibility of the soul. When we classify, for purposes of study and description, the various operations of the mind and assign these operations to different powers, we are not to suppose that we can divide the mind into different com-

partments, like so many pigeon-holes in a secretary's letter case. No division of the soul itself is possible, either in essence or in energy. In all mental operations the acting agent is *one* and the same, and the energy is likewise one and indivisible. When we remember, or judge, or feel, or will, the *whole* soul acts, and not a particular part or so-called organ of the soul.

By mental faculty we mean a particular mode of the soul's activity. The human hand may serve for illustration. With the same hand I can paint a picture, chisel a statue, write a letter, perform a surgical operation, read a page of raised type, hold conversation with a deaf-mute, play the piano or organ, and perform a thousand other offices. In all these operations, it is *one* and the *same* hand and the *whole* hand that acts. So we are to represent to ourselves the so-called faculties of the soul—they are modes of exercise, forms of mental activity, definite ways in which the soul puts forth its energy. Therefore, when we analyze and classify mental phenomena and faculties, we analyze and classify *modes of mental activity*. In our sense of the word, faculties are simple or complex, primary or secondary, according to the nature of the mental exercise in question. From our standpoint we may speak also of a *musical faculty*, meaning thereby that mode of the soul's activity which manifests itself in musical conceptions and perceptions, musical ideals, musical emotions, etc. The musical faculty is complex in its nature, involving intellectual, moral, and aesthetic elements, the aesthetic decidedly predominating.

The Musical Faculty Universal. A question of practical interest arises, namely, Is *every* soul endowed with

the musical faculty? Has everybody capacity for music and can anyone learn music? The idea quite extensively prevails that musical gifts are the exclusive possession of a highly favored class of people called *geniuses*. Only the musical *genius* can learn music; or rather, music is not something to be learned at all as other things must be learned, but it is a direct gift from the Creator to the *genius*, and he who is not such a *genius* can never hope to become a musician. This idea belongs to the shadowy mysticism of the middle ages, and its lingering presence in our time has been a great barrier in the way of progress in musical science and art. It is a vain delusion which a little knowledge of psychology can easily dispel.

There is such a thing as genius which marks a broad distinction between individuals. The Latin word *genius* signifies the divine nature which is innate in all human beings. Webster defines genius as "that peculiar structure of mind with which each individual is endowed, but especially mental superiority and uncommon intellectual power." The man of genius is one who is endowed with unusual mental powers. It is a matter of common observation that mental gifts vary greatly, but where the sphere of the common order of mind ends and that of the genius begins no one can determine, for there is in nature no such dividing line. There are some rarely gifted spirits that live and move in the high-peak regions and look down upon the world from "inspiration point"; a much larger number live in middle altitudes, while the great mass of workers belong to the lower plains of life. To the first class belong such men as Homer, Plato, Virgil, Dante, Shakespeare, Beethoven, etc. Like the high mountain peaks of earth, they are few in number,

and far apart in time. No one needs to be told which is Pike's Peak or the Matterhorn among other neighboring peaks, for these giants bear the testimony of their grandeur in their own appearance; so the lofty spirits of history need no title to speak their claim to eminence, for they have in themselves the unmistakable marks of their transcendent greatness. These are *geniuses* in the true sense.

In the lower and degraded sense, a genius is one who dabbles in everything but does nothing well. If a young man be able only to play a few tunes upon each of the several horns of a brass band, immediately he is called a genius. There is much point in Josh Billings' quaint definition, "A genius is a person who thinks he knows everything, but who in reality knows nothing, except how to spill 'vittles' on his clothes." Such genius substitutes imaginary gifts for true merit and for hard work. It is, alas! too common a product of our age. The musical world is not without numerous examples.

Genius stands in antithesis to talent, though often mistaken one for the other. *Genius* is *creative; talent* is *imitative*, and inasmuch as men rarely become great by imitating others, men of talent seldom acquire universal fame. *Genius* makes its own laws, is, in fact, a law unto itself; it boldly oversteps those rules which minds of lower order slavishly observe; *talent* follows in the steps of genius and patiently submits to those rules which genius dictates. *Talent* learns art-rules from books; *genius* reads them within herself. "*Talent* is a bird fastened to a string; *genius* is the bird unfettered." *Genius* in a certain sense is beyond criticism. The immortal bards, musicians, painters, sculptors, etc., are kings in the realm

of art by a kind of "divine right," and they wield their scepters in serene heights above the storms of conflicting opinions, selfishness and bigotry which rage on the middle and lower slopes. *Genius* dares to do things for which *talent* would be severely criticised. It is related that Beethoven was once approached by a young man with the request that he should examine one of the young student's compositions. The master made a few corrections, but he was soon reminded of the fact that he himself in like manner had overstepped the rules. Beethoven smiled and said, "I may do so, but you dare not."

Genius is the highest order of endowment. "The average man can never produce those works of art which genius produces, no matter how he applies himself, or who teaches him. Lacking, as he does, that high degree of sensibility which distinguishes genius, he fails to receive those impressions which genius alone can receive; how, then, can he give expression to the lofty inspirations of the man of genius?" When genius conceives a work of art, he does not take pencil in hand and say, Now I will write a grand symphony, nor does he prepare colors and say, Now I will paint a Madonna. True genius is not so self-conscious; he knows but faintly his own methods by which he works. In every great masterpiece of genius there is something inexplicable, something that does not yield to analysis, something mysterious. We may get nearer and nearer to the secret, but we are never quite able to lay our hand on it; in the last analysis it is inseparable from the artist's personality, which is a thing primary and not resolvable into elements. There is in highest art something that cometh not by observation: this sacred and inscrutable something is what

true genius gives us in a great work of art and what distinguishes it from a common production.

Oliver Wendell Holmes classifies intellects thus: "*One*-story intellects, *two*-story intellects, *three*-story intellects. All fact collectors, who have no aim beyond their facts, are one-story men. Two-story men compare, reason, generalize, using the labors of the fact collectors as well as their own. Three-story men idealize, imagine, predict; their best illuminations come from above, through the skylight. They are the men of genius."

Genius lives in a world of its own, a world into which the average man can never hope to enter. Genius is always in advance of the times and sees with prophetic eye the best things of distant ages. It is the lofty mountain peak which first catches the rays of the rising sun, while yet darkness and deep shadows rest in the valley below where the common people dwell. As the eagle soars aloft toward the source of light, while the little birds nestle in the hedges near the ground, so genius in the flights of its imagination lives in regions above the common plains. "And as little as the bare eye can count the strokes of the eagle's wings when it appears only as a mere speck before the clouds, so little can the average man count and comprehend the beatings of the wild-throbbing heart of genius" (Mertz).

These remarks about genius truthfully represent the facts in the case as we see them in the various departments of the art world. Genius is no fiction, but a sublime reality to which the wise man will gladly show deference and reverence. With these facts before us we come back to our question,

Is the Musical Faculty Universal? Can anybody be a musician? Not everyone can become a *great* musician; not everyone can be a *genius* in musical art. No; that implies a rare combination of qualities, an extraordinary degree of endowment which the Creator for wise reasons has bestowed only upon few of the sons and daughters of earth. There are only few great mathematicians, astronomers, poets, painters, architects, orators, musicians. The Beethovens, Händels, Mozarts, Haydns, Mendelssohns, Liszts, Bachs are very rare. To such a high degree of excellence, not everyone may hope to attain.

While not all men are geniuses and have their spheres marked out in the sublime heights, yet all have God-given gifts, in higher or lower degree. We may not have ten talents, nor five; it may be we have only one; still it is a talent given us by our Creator, and it is our duty to improve that one talent to the best of our opportunity and ability. Our gift is capable of cultivation and should receive our earnest and conscientious attention; we must not, like the unfaithful servant, go and bury our talent in the earth. There are many who compose music, paint pictures, carve out statues, make verses, but do not produce such gems of art as those that come out of the workshop of genius; yet the work of these amateurs and men of talent is not to be despised because it is inferior to that of the highest genius, for it occupies an important place in the temple of art and deserves honorable mention in the history of art products.

Yes; doubting soul, whoever you may be, *you* have the musical faculty, *you* may learn music, *you* may achieve commendable success in the line of your

desires. Application will tell the story, earnest work will decide your capability in music just as in everything else. Faithful work is the measure of success. Even men of genius have always been hard workers, diligent students. Be not deceived; genius is never a substitute for labor. There is no excellence without labor. If you do not belong to the class of geniuses, you are a fellow being, a brother, a sister of these great men, and this thought should encourage and inspire you. You have the same kind of faculties, the same modes of mental activity as the rest of mankind. Every rational soul has by creation the same faculties, however they may differ in their degree of development and efficiency.

I know this statement is contrary to the traditional idea and to the popular notion about the matter, but I am persuaded that it rests on a sound psychologic foundation. Every normal human soul has capacity for learning arithmetic, history, languages, science, literature, the arts, business, stenography, banking, locomotive engineering, type-setting, house-building, stone cutting, etc., etc.; but not everyone may be a master in each of these lines. So each and every soul has capacity for appreciating and learning music. In a public address, W. H. Cummings, principal of the Guildhall School of Music, London, said: "Not all people can be great musicians, but children are born with the musical faculty as well as with pairs of eyes and legs. . . If children are not taught to make good use of the faculties which God has given them, it is not a very wonderful thing that these same faculties, instead of improving, should become almost non-existent. . . All may become excellent and discriminat-

ing listeners, and distinguish what is good and what is worthless. No one can tell whether a child may not turn out a Mozart, a Paderewski, an Albani, a Sims Reeves, or what not, unless its faculties are cultivated; and it is the duty of parents to give their children the highest possible education through good instructors, remembering that nothing is of any value unless it is studied with a really earnest purpose."

The musical faculty is not an exclusive gift of the favored few. Let the mischievous delusion that has so long held sway be dispelled once for all. Musical science and musical art rest on the same psychologic basis as everything else that may be learned. Not a vague mystical theory, but solid experimental facts of mind must decide the question. To this idea pedagogical theory in all branches of instruction is gradually adjusting itself; from this foundation musical education in our day has found new points of departure. As we come to understand the psychological facts in the case we introduce musical instruction in the common schools in an exact parallel with instruction in arithmetic, geography, history, language study, etc.; we teach children the rudiments of music just as we teach them the rudiments of other subjects, and do not once inquire whether or not any of them have been destined to the high realm of musical genius. As they have ears and eyes and voices and fingers and minds, we take it for granted that they can learn music just as they learn anything else.

Who Shall Devote Himself to Music? Not those who can't and won't study anything else, not those who are lazy and inflated with a false notion of genius, not those who are good for nothing in other things. Who shall study law, or medicine, or civil engineer-

ing? Surely not the idiot, but those who have the finest endowments, the most enthusiastic love for study, the indomitable will, unflagging perseverance, sound mind and sound nerves. So, whoever has these general prerequisites may devote himself to music with a fair show of success.

QUESTIONS.

1. State wrong conceptions of a mental *faculty*.
2. Give definition of *faculty* and illustrate.
3. Meaning of *musical faculty*.
4. What question of practical interest arises?
5. What erroneous view about musical genius?
6. What is meant by genius? Give examples.
7. What is said of genius in a degraded sense?
8. Explain antithesis of *genius* and *talent*.
9. Relate incident about Beethoven, and what does it illustrate?
10. Give substance of quotation from Oliver Wendell Holmes.
11. Why the foregoing remarks about genius?
12. Can anyone become a musician?
13. Is the musical faculty universal? Explain precisely the author's standpoint.
14. Give substance of Mr. Cummings' remarks.
15. Point out some signs of the times in relation to the musical faculty.
16. What must finally decide our question?
17. Who should devote himself to music?

CHAPTER IV.

Concept-Mass and Psychic Life.

CONCEPTS are ideas formed in the mind from sense-impressions by thinking, reflecting, reasoning, etc. Soul-life is concept-life. The stream of consciousness at any moment of our existence consists of concepts, and without concepts there is no consciousness. By means of the several sense-channels a great variety of impressions from the outer world is brought into the mind as material from which to form ideas. When we think of all the objects that pass before the open eye in the course of a day, a year, a life-time; of all the sounds that stream into the ear; of all the odors and tastes that come in contact with their appropriate nerves; of all the tactile impacts that occur over the entire area of the sensitive skin; and when we remember that each one of these innumerable nerve-excitations leaves its impression in the respective centres to be called up at any moment into a distinct concept in the process of conscious thought, we begin to realize how vast and how varied in the average life is the store of material for concepts.

The individual concepts starting from sense perceptions, do not stand in isolation, but each one is related directly to others of the same group, and indirectly to all the rest. No single concept either *does* or *can* stand alone, just as no single sense-impression can be disconnected from others. The concepts constitute a numerous family, between each member of

which there is a natural bond of connection. This is the second great fact that comes to view in our study of psychic life. A third fact immediately follows, namely, that every related concept *modifies*, and in turn, *is modified*, by its correlative concepts. To this related and reciprocally modifying body of concepts the name *concept-mass* is given, a name very popular among German psychologists, especially those of the Herbartian school. It means the sum total of all the concepts, conscious and subconscious, in their correlated condition, that a soul at any stage of its existence possesses. The word *mass* in the compound denotes more than simply a great number, a promiscuous collection; it denotes also the relationship between the individual members of the collection.

Perhaps, at no moment in the history of a soul can it be said that its life consists in one single and unmodified concept,—soul-life consists always in a concept-mass. Pure, that is, unmixed, sensations and concepts have no existence in reality. Sensations and concepts as psychic phenomena never appear in their primitive isolated character, but always in their apperceived, i. e., modified state. Soul-life from the beginning is a complex life and all its phenomena are complex. Practically psychology has to do with concept-mass. The interrelations of ideas and the mutual modifications which ideas undergo when coming in contact with other ideas, are a subject exceedingly interesting and instructive, and, from an educational point of view, highly important. Many great problems of psychic life here take their rise and find their solution. If at any moment we have a certain concept-mass, with such and such consistent ideas, making

up a particular aggregate experience, what effects will be produced if now new ideas come in?

In general, the old will modify the new, and the new in turn will modify the old, but not in the same degree. The old ideas, other things equal, are far more powerful than the new, because they are firmly established, rooted, as it were, in a coherent concept-mass, while the new ones come in as individuals, not yet fortified by a network of relationships. The new-entering concept on first thought appears to have the advantage, in that, on account of its novelty, it gains greater attention, especially if it is a sense-perception, whereas the older concept-mass needs time in which to assert itself; but the fact is different. The older concepts, on account of their many-sided connections in the web of concept-series, are able to attract to themselves more and more assisting concepts, and so finally assimilate and absorb the newer.

Many important educational consequences flow from these primary facts of psychic life. The process of gaining knowledge implies more than simply bringing new facts into the mental storehouse; gaining knowledge is a process of assimilation of new ideas in a growing concept-mass. This implies that the successive items of instruction to be worth anything, to be of real value in soul culture, must be brought into their normal thought-relations in the mind of the pupil. To do this it is necessary for the teacher to study the individual lives of his pupils, find out the exact state of their concept-life, their needs; then he must adapt his instruction to the case in hand. The hit-or-miss way of giving instruction is psychologically wrong and does not accomplish its end, besides being an injury to the pupil. The intelligent teacher

will manage to get acquainted with the inner life of the pupils, will try to look out at things from their point of view, find out their prejudices, their likes and dislikes, their native reactive tendencies; then he will suit his instruction to the needs of the case, he will put each new fact into its right relation with other facts already there, he will seek to coordinate and organize the items of knowledge in the pupil's mind, just as the forces of nature organize the mineral elements in the growth of a vegetable or animal body; like the maker of mosaics, he will select and shape and polish each minutest block with special reference to the place it is to occupy, he will bring each separate piece into right relation with others in respect to form and color, and thus the process will go on until the picture is finished, a thing of beauty and a joy forever. In this way the new facts that come into the pupil's experience will have an advantage from the start, and so may reasonably be expected to bear good fruit; otherwise they would lie loose, so to speak, in the mind, as seeds cast upon the surface of the ground.

If the older concepts are wrong or defective, as will likely be the case with the untrained pupil, it is the business of education to correct or improve these. Our psychology suggests a rational way of doing this. The older concepts already in the concept-mass absorb the newer, but in doing so they are themselves modified; the newer in being absorbed yield something of permanent value to the growing mass. Hence the importance of conveying only such ideas as are full of life and vigor; the more strength they have, the greater will be their power to modify the old and faulty ones. We know how deeply rooted old

prejudices and wrong notions are, and how difficult it is to remove or modify them. It is always dangerous to tear out as by force any given erroneous ideas in a person's concept-mass, and the reason is not far to seek. The wise teacher will therefore use other methods to accomplish his purpose. The parable of the tares suggests an interesting application of our principle. In reply to the disciples' question, whether they should go and remove the tares, the Savior said: "Nay; lest while ye gather up the tares, ye root up also the wheat with them." At the foundation of this utterance lies our principle of *apperception*, as it has been called by some. If the Great Teacher recognized this principle of mind in dealing with error among men, so also should every other teacher.

Upon this doctrine of apperception, as we have unfolded it above, rest the facts of association, memory, etc. The laws of habit are also grounded in it. Indeed, almost every psychological and educational principle rests on this doctrine concerning concept-mass. The study of psychic life in whatever form cannot proceed intelligently without reference to it at every step. In moral and religious training it is of vital importance. In the light of this principle is seen the wisdom of prepossessing the mind of youth with a body of sound moral principles and religious teachings. Hence the value of teaching children from their earliest days Bible passages, sacred hymns, patriotic sayings, useful maxims, sound principles, etc.; these make up a permanent and solid concept-mass in which character shall take root and grow. Hence also the wisdom of putting the better class of music into the hands of beginners, of implanting true art principles as early as possible. If these beautiful and

useful plants can be made to grow and get a good start in the minds of the young, they will gradually absorb and render harmless many a noxious weed that may come into the soil later on. Let the pure love of art send its roots deep down and all through the child's concept-mass, then there will be a good foundation for a right artistic education, then will the unfolding soul-life be rich and interesting and beautiful. In the light of this principle, it makes much difference what kind of pictures we view and admire, what music we hear, what scenery we look upon, what ideals we cherish, what companions we associate with, what operas and theaters we patronize, what literature we read, what songs we love, in short, what new concepts in any way come into our minds to take their place in our permanent concept-mass. In this our character stands rooted, from this the stream of consciousness is supplied with ideas, in this consists our practical soul-life.

QUESTIONS.

1. Define concepts.
2. Whence arise concepts?
3. What is said of the *relations* of concepts?
4. Fact about the *modification* of concepts?
5. What is meant by concept-mass?
6. In what does soul-life consist, and what is its nature?
7. State the law of modification of concepts.
8. Why are the older concepts stronger than the newer?
9. Of what value in education is the doctrine of concept-mass?
10. What is implied in the process of gaining knowledge?
11. What pedagogical application of our principle is named?

12. How is teaching like making mosaic pictures?
13. By what method is a faulty concept-mass to be corrected, and why?
14. Illustrate by reference to the parable of the tares.
15. By what other name is the doctrine of Concept-mass known?
16. What other great facts rest on the doctrine of apperception?
17. Show its importance in moral and religious training.
18. What of its value in art education?
19. Its value in general psychic life?

CHAPTER V.

Means of Musical Expression.

We have said that music is first a conception of the mind and afterwards an expression in sound, — first ideal, and afterwards formal. Expression means literally *pressing out*, that is, giving objective form to subjective ideas. In technical sense, expression means a lively or vivid representation of meaning, sentiment, or feeling; significant and impressive indication, whether by language, appearance, or gesture; that manner or style which gives life and suggestive force to ideas and sentiments. In music, according to Stainer and Barret, it means the power or act of rendering music so as to make it the vehicle of deep and pure emotion; the spirit of music as opposed to the mere mechanical production of sound. In rendering works of a higher class, a true expression involves the merging of the artist's personality in an enthusiastic effort to carry out to the highest extent the fullest meaning of the composer. In whatever sense used, expression means fundamentally the act of giving outward form to mental conceptions.

Music as a language employs certain symbols, such as lines, spaces, clefs, notes, rests, bars, accent marks, etc., by the use of which the soul's ideas and emotions are translated into sensuous forms. Our present inquiry is, What are the means by which this expression of the soul's conceptions is effected and by which

the soul gains experience of the sounds and symbols employed in music? To serve as a medium of communication between the inner and the outer worlds the Creator has given us a nervous system, suited to the offices it is intended to perform.

The Nervous System. The nervous system is the mystic borderland between the realms of the spiritual soul and the physical universe. What strange messages pass back and forth over this dim borderland region! Jacob, in his beautiful vision, saw angels ascending and descending and from the top of the ladder he heard communications from the Lord. What the ladder was in the patriarch's dream, the nervous system is in our psychic life, namely, the medium of communication between the spiritual and the material. Through the nervous system the various phenomena of the outer world find an inlet to the soul, and the ideas, emotions and volitions of the soul have an outlet into the physical world.

The nervous system is a wonderful mechanism, whether viewed in regard to the construction and adaptation of its several parts, the delicacy of its reactions, or the perfection and variety of its offices.

The Cerebro-Spinal Axis. The nervous system consists of two main parts, the *cerebro-spinal axis* and the *sympathetic* or *ganglionic system*. The cerebro-spinal axis is divided into the brain, the spinal cord, and the nerves. Foremost in importance is the brain, a large mass of nervous matter which fills the cavity of the skull, with an average weight of about 49 ounces, the maximum being 64 and the minimum 20, ounces. It is divided vertically into two lobes or hemispheres by means of a medial septum of white fibrous matter, which in the center and lower parts

serves to bind the two hemispheres firmly together. The surface of the hemispheres is composed of gray cellular matter, arranged in irregular groups, giving rise to the so-called convolutions of the brain, which vary greatly in depth and complexity in different states of life.

Four divisions of the brain are distinguished: the *cerebrum*, by far the largest part, occupying the upper and front portion, being also the highest in function; beneath and behind this, is the *cerebellum*, or little brain; while below and overshadowed by the upper lobes are seen in order the *pons varolii* and the *medulla oblongata*.

The downward continuation of the medulla oblongata from its point of emergence through the foramen magnum in the lower part of the occipital bone, is called the *spinal cord* which is contained within a kind of tube in the spinal column and extends the whole length of the column. From the spinal cord radiate numerous smaller trunks of nerve fibres called simply *nerves*.

The *nerves* are given off from the spinal cord in pairs, one on each side, numbering in all 31 pairs, grouped into, counting from above, "cervical" (8), "thoracic" (12), "lumbar" (5), "sacral" (5), "coccygeal" (1). Each nerve arises from the side of the cord by two roots, anterior and posterior, the anterior being composed of motor nerve-fibres, and the posterior of sensory nerve-fibres. The spinal nerves are not single fibres, but bundles of very many smaller fibres bound together by connective tissue and surrounded by a membranous sheath called *neurolemma*. The nerve-fibres are exceedingly small and delicate, the medullated varying from $\frac{1}{1600}$ to $\frac{1}{3000}$ inch in di-

ameter, and the non-medullated variety from $\frac{1}{6000}$ to $\frac{1}{8000}$ inch in diameter, the finest fibres in the nerves of special sense, in some instances being only $\frac{1}{100000}$ inch in diameter.

The *nerves* are classified into *motor* and *sensory*, the former carrying the commands of the will or the inner impulses of the soul outward to the muscles, giving rise to the various movements of the body and bodily organs, the latter conveying the stimulations of the nervous end-organs inward to the inferior centres and finally to the brain, giving rise to sensations. The peripheral ends of the nerves are distributed all over the surface of the body, but not everywhere in equal numbers, being most numerous in those parts of the skin which are most sensitive, such as the forehead, cheeks, nose, lips, finger-tips, etc. It is farther observed that the surface distribution occurs in groups or spots, e. g., temperature-spots, pressure-spots, pain-spots etc.

The Sympathetic System is composed of several distinctly marked groups of nervous ganglia connected by nerve-fibres, resembling somewhat a string of beads. The following groups may be particularized: first, a double string of ganglia, one on each side of the spinal column; secondly, three groups in the cavity of the thorax and abdomen, viz., one at the base of the heart, another in the upper part of the abdominal cavity, and a third in front of the last lumbar vertebra; thirdly, some smaller groups widely distributed over the body, especially in connection with the veins and arteries.

From this arrangement it would appear that the sympathetic system serves to connect the various organs of the body with each other and all of them

with the cerebro-spinal system, thus bringing every part of the entire complex organism into complete harmony—it serves as a bond between the sensations, emotions, and ideas of the brain and those organs in the chest and abdomen whose condition is so closely related to the various psychic states, e. g., the organs of circulation and respiration. The student's special attention is called to this mechanism, since it affords a convenient physiological basis for the explanation of many a psychic phenomenon and of many other things of great value to the musician.

Nervous End-Organs. Examining the peripheral ends of the nerves more closely, we find that the nerves do not terminate abruptly, but end in a peculiar kind of mechanism, varying in different parts of the body, in size, structure and delicacy according to the offices they have to perform. These structures are known as end-organs. Among these, especially prominent and important are the end-organs of the five special senses, viz., sight, hearing, smell, taste, and touch. The end-organ of the optic nerve is the eye.

The Eye. The human eye is a wonderfully complex organ and made with the most admirable skill, illustrating the wisdom, power, and goodness of the Creator. It is globular in shape and fits snugly into a cavity in the anterior portion of the skull, where it is protected from injury by several accessory parts. Its outer walls are composed of three concentric layers, called respectively the sclerotica, choroid coat, and retina. The sclerotic coat is on the outside, a firm opaque substance, white in color, the "white of the eye" being the anterior part of it. In front a transparent, horny, highly convex part, called the *cornea*, is inserted into the sclerotica, just as a watch-crystal

is set into its rim. Next to the sclerotic coat is a pigment layer, called the *choroid* coat. Inside of this is spread out the *retina*, which is but an expansion of the optic nerve after its entrance into the eye-ball through an opening in the rear portion of the sclerotica. The space inclosed by the walls of the eye-ball is occupied by the aqueous and vitreous humors, the crystalline lens, and the iris. The *iris* is a kind of varicolored curtain dropped down in front of the lens, having a circular aperture in the centre, called the *pupil*. The *lens*, together with the humors, the ciliary processes, the suspensory ligaments, and certain very delicate muscles constitute the focusing and refracting apparatus. Instead of shifting the position of the lens as in focusing a camera obscura, the accommodation of the eye to varying distances is accomplished by changing the convexity of the lens by means of certain muscles.

The *retina* is the most important part of the eye, for it is in this that the seeing process takes place. Its microscopic structure reveals ten different layers. The fibres of the optic nerve having pierced the sclerotic shell, spread out radially in a thin film over the inside surface of the choroid coat, ending in the layer of *rods* and *cones*, which, it is believed, are the specific organs for taking up the influence of the light waves. For further details the student is referred to some good text-book on physiology, e. g., Martin's "*Human Body*."

Eye-Culture. Though the mechanism of the eye is perfect in itself, the art of seeing must be learned—the child by trial and by slow degrees must acquire the right use of its eyes. Also, the adult eye may be indefinitely cultivated in delicacy and accuracy of vision,

as well as in other respects. The importance of eye-culture can not be overestimated. When we remember that by means of the eye we gain by far the greatest *quantity* and also the best *quality* of our knowledge of the outside world, that through the "windows of the soul," as the eyes have been called, a person's true character shines forth, that the eye is a powerful instrument of the will and an essential medium of expression, we can judge how important it is to every person in general and to every artist in particular to cultivate the art of seeing aright.

Our eyes were given us to be *used* in seeing things and seeing them correctly. It is a reproach if "we have eyes to see, and see not," or "seeing, but do not perceive." We should learn to see the things that are useful and good and beautiful in the great world about us, for in them the thoughts of the Divine are incarnated. Some one has said, "that all things are made of thought." The poem is thought expressed in words; the grand cathedral is stored-up thought expressed in stone; the famous picture is thought expressed in shades and colors; the great statue is thought expressed in marble or bronze; the charming musical production is stored-up thought expressed in notes and sounds; the works of nature are the stored-up thoughts of the Creator expressed in mountain and valley, in the dewdrop and the glowing sunset, in the rose bud and the lilycup, in the babbling brook and the tumultuous waves of the sea, in the quiet sunshine of day and the brilliant stars of the midnight sky, in the mineral crystal and the sculptured snow-flake, in the forest and in the ponderous globes of space—all beautiful and interesting things made up of divine thoughts, everywhere appealing to our

admiration and inviting our study, in observing which we think after Him the thoughts of their glorious Creator

The Ear. The organ of hearing is composed of the outer ear, the middle ear, and the internal ear. The outer ear is made up, first, of the *conch*, a kind of funnel-shaped, movable, cartilaginous body located on the side of the head, whose office seems to be to collect the sound-waves and start them inward towards the brain; secondly, the *external meatus*, a tube-like prolongation of the conch a contrivance similar to the ear-trumpet; and thirdly, the *drum-head*, a conical membrane, stretched across the auditory canal, called the *membrana tympani*, or head of the drum.

The *middle ear* extends from the tympanic membrane to the vestibule of the internal ear. The cavity of the drum or tympanum, as it is sometimes called, contains a chain of three small bones called respectively, on account of their shape, the hammer, the anvil, and the stirrup. The office of these small bones seems to be to transmit sound vibrations and perhaps act as dampers, similar to the dampers of the piano-forte. From the lower side of the tympanic cavity proceeds a small tube, called the *Eustachian tube*, which opens into the pharynx, i. e., the upper and rear part of the mouth. This serves the purpose of regulating the varying atmospheric pressure upon the tympanic membrane. The general office of the middle ear is to transmit the sound waves on their way to the brain and to modify these vibrations so as to prepare them to act as stimuli on the sensitive nerve filaments in the internal ear.

The *internal ear* or *labyrinth* occupies a cavity in

the petrous portion of the temporal bone, said to be the only completely ossified part of the skeleton at the time of birth. It consists of three divisions, the vestibule, the semicircular canals, and the cochlea. The *vestibule* is a kind of antechamber through which access is gained to the other two compartments. The *semicircular canals*, three in number, are situated back of the vestibule. They are about one inch long and $\frac{1}{20}$ of an inch in diameter, and contain a fluid which performs an important office in the transmission of the sound waves. The function of the canals is not fully understood. Some have thought that they are the organs for perceiving *noises*. This theory rests on a fallacious view of the nature and cause of noises, and so must be rejected. Evidently we hear noises and tones with the same organ and so we do not need a special organ for perceiving noises. Generically noises and tones are not different, the one by degrees shading into the other. Another theory is that the canals together with the vestibule are an apparatus for maintaining the equilibrium of the body and for estimating position in space.

The *cochlea*, so called from its shape resembling that of the snail shell, contains the true organ of hearing, the other parts being only accessory. It winds 2½ times around a central axis (modiolus), like a spiral staircase. The *basilar membrane*, which in a way corresponds to the carpet spread out on a spiral staircase, consists of a wonderful arrangement of cells, called the organ of Corti. The rods and fibres of Corti, 6,000 or 8,000 in number, are arranged in rows on the basilar membrane, like the keys of a piano-forte. These rods increase in length from the base to the apex of the cochlea. The fibres are per-

haps the supporting bases of the hair-cells, 20,000 or more in number. "The hair-cells," says Prof. James, "would thus seem to be the terminal organs for picking up the vibrations which the air-waves communicate through all the intervening apparatus, solid and liquid, to the basilar membrane."

Here we see an apparatus fashioned on the plan of the harp,—a harp, not of a thousand, but of ten thousand, strings. This is the wonderful instrument by means of which we are able to hear and to discriminate the great variety of sounds that come in from the outer world. How it works is not so well understood. Our knowledge of the subject in the present stage of scientific investigation, indeed, is very unsatisfactory. Says Hensen: "It is possible that the working of this apparatus may be altogether different from any of our present conjectures." Understanding the mechanism of the ear and calling to our aid the principle of sympathetic vibration and the laws of harmonics so ably unfolded by Helmholtz, we can explain with tolerable satisfaction the process of perceiving and analyzing the various sounds that reach the nerve-filaments in the inner ear.

Range of the Human Ear. It is estimated that we can hear about 11,000 different tones. The range of the average human ear is about nine octaves of pitch, that is, from about A_2 of the sub-contra octave (27½ vibrations, German scale) to above c^7 of the seven-times-marked octave (16,896 vibrations). Preyer makes the lower limit of audibility 16 vibrations per second; Helmholtz, 34 vibrations for the lowest musical tone. Tuning forks making 28 vibrations per second may be heard as a low droning sound. For most ears, 28 to 32 vibrations make a buzzing,

groaning sound. The upper limit of audibility varies greatly, being from 20,000 to 22,000 vibrations per second for the majority of ears. Some ears can perceive sounds made by 30,000 to 40,000, and very sensitive ears, as many as 50,000 vibrations per second.

Ears differ greatly also in the ability to distinguish very slight variations in pitch. Trained ears can distinguish, differences of ⅛ or ¼ of a single vibration, namely, in the range most easily covered by the human voice (c^1 to c^3). Where the piano gives only 24 notes, the ear can distinguish 3,000. In the upper limits of the scale (e. g., above c^5) well trained ears can distinguish notes differing by 100 or even by 1,000 vibrations per second.

It is to be noted that the capacity of the ear is vastly greater than that of the human voice. The pitch of the voice in singing is usually between 87 and 778 vibrations per second (i. e., from the deep F of the bass singer to the upper G of the treble singer). Christine Nilsson's voice is said to have reached 1,365 vibrations, which corresponds to f^3, on the basis of 256 double vibrations for middle C.

Beyond about 36,000, or possibly 50,000 vibrations per second the ear cannot tell us anything of what happens in the vibrating body; nor can any other sense give us the desired information. There is simply a blank in our sense-experience until we come to about 18,000,000 vibrations of ether per second, when we get a sensation of heat, a temperature far below *dull red.* From the limit of lowest perceptible heat up to *red heat,* i. e., luminosity, there is an enormous leap of 471,982,000,000 vibrations. As we pass upward from the red end of the spectrum the

vibrations rapidly increase until we come to the extreme limit of the violet which is represented by 733,000,000,000 vibrations per second. Beyond this limit the vibrations are so rapid that neither the ear nor any other sense can take them up, and again there is a blank.

The Art of Hearing. As in the case of the eye, so with the ear—the proper use of it must be learned. The new-born child must learn the art of hearing. This art has both its physiological and its psychological side. On the one hand, must be learned the accommodation of the physiological organism to the physical wave-impulses that stream into the inner ear; on the other hand, must be learned the translation and interpretation of the external impulses into sensations, conceptions, ideas, emotions, and volitions of conscious experience. The child has everything to learn that pertains to the vast world of sounds. The adult ear also has much to learn, for it is true of all of us that "having ears, we hear not." There are innumerable sounds all about us which our dull ears fail to perceive. There is enrapturing music in the air, there is the "music of the spheres" which sing as they move majestically in the depths of space, yet our gross ears hear it not.

"There's music in the sighing of the reed;
There's music in the gushing of a rill;
There's music in all things, if men had ears:
The earth is but an echo of the spheres."

—BYRON, *Don Juan.*

"Music is in all growing things;
And underneath the silky wings
Of smallest insect there is stirred
A pulse of air that must be heard;
Earth's silence lives, and throbs, and sings."

—LATHROP, "*Music of Growth*".

"The rustle of the leaves in summer's hush
When wandering breezes touch them, and the sigh
That filters through the forest, or the gush
That swells and sinks amid the branches high,—
'Tis all the music of the wind, etc."

—M. G. BRAINARD.

Truly, there is music everywhere, but, oh, these dull and heavy ears! Our ears were given us to hear, and therefore we should cultivate them to do what they were designed to do.

We Must Learn to Listen. No other class of people have so much need of cultivating their ears as music students and the best way to do this is to attend to sounds of all kinds and diligently learn to listen. The true way of beginning a musical education is, not by drumming on the piano or mechanically repeating the notes of the scale, but by learning to listen aright. Robert Schumann begins his list of sixty-eight rules for young musicians by saying that we should *take particular notice of the tones about us.* He continues: "The cultivation of the ear is of the greatest importance. Endeavor early to distinguish each tone and key. Find out the exact tone sounded by the bell, the glass, and the cuckoo." That is a very good rule; if we follow it day after day, we shall see how many are the tones about us which we scarcely ever notice. It is important to listen attentively to the scale-tones, in order to become familiar with each separate tone. In this way we are able to form a clear conception not only of the various tones themselves but also of their relation one to another. We must *think* the separate tones clearly and sharply so as to realize just how each one sounds in the scale, and what it signifies. All this is a severe mental exercise, but it yields the best of results. Ear-training

is thus a process of mind-training, and such on psychological principles it ought to be.

Schumann says, "We should learn to refine the inner ear;" but refining the inner ear means training the mind to interpret aright the sound impulses that come to the brain through the outer ear. It means further to cultivate the mind's power to form clear and accurate conceptions of the tones which the outer ear reports, to judge correctly concerning them, and to develop the power of thought. Thus eartraining is of the very first importance in a musical education. The music student needs to learn first and last to *think* music; without this, he can never be a musician. This is a great principle which psychology seeks to inculcate. Simply to confine the pupil to notes and neglecting to do anything that will incite him to *listen* clearly and sharply and to form for himself a mental image of that which he hears is to proceed contrary to the principles of mind and so to do the pupil great harm.

The prevailing methods of studying and teaching music are radically wrong. Instead of training the inner ear and refining it we make it more dull; instead of cultivating the habit of listening, we do just the opposite. Instead of forming correct habits which will aid the pupil in his progress and make his work easy and pleasant, he forms bad habits which will be a hindrance to him at every step on the way and make his muscles and nerves his enemies, instead of obedient helpers.

Mr. Tapper has very truthfully said: "One of the quickest ways to become unable to hear sounds correctly is to play the piano without *thinking* fully of what we are doing. Therefore it must be a rule never

to play a tone without listening accurately to it .... No rule can exceed in importance this one, never to make any music unthinkingly." We should "listen as if listening were our life." And indeed it is a large and very important part of our cultivated life, our higher music life.

And what a wonderful tone-world this is in which we live! What a world of music is round about us! What variety, what wealth of tones! The rustling of the leaves, the sighing of the breezes in the pine needles, the chirping of insects, the twittering of birds, the bleating of lambs, the lowing of cattle, the neighing of horses, the crowing and cackling of barnyard fowls, the croaking of frogs, the hooting of the owl, the barking of the watch-dog, the drumming of the pheasant, the cooing of doves, the lonely piping of the cuckoo, the murmuring of the shady brooklet in its forest solitude, the dashing cataract, the roaring of the sea, the whining and whistling of the winds in the cordage and rigging of the vessel, the roll and crash of thunder, the wild fury of the tempest, the rumbling of wheels in the street, the tramp, tramp of horses' feet, the quaint cries of the fruit and vegetable venders, the clang of bells, the shrill scream of the steam whistle, the sound of saw and hammer, the puffing of engines, the hum of machinery, the report of guns, the buzzing of bees,—and when the myriad sounds of busy life and of industry have died away and you stand alone under the canopy of heaven in the silence of midnight, then *listen*, and you shall hear a wonderful wealth of sounds issuing forth out of the regions of silence—*listen*, and you shall hear things which the eye has not seen nor the outward ear heard, voices of the unheard and unseen, whispers of eternity, throb-

bings of the great world-soul—*listen* to all this infinite variety of tones, and you have the materials for your arias, your sonatas, your symphonies, your oratorios.

What is it to Listen? To listen is to give undivided attention to what is heard, to bend, and hold the thought upon the sounds that come in through the outer ear, to concentrate our mental energy upon our sound sensations. Listening is thus a mode of thought concentration. If we would learn to *listen* correctly we must form the habit of thinking intently, of fixing the *mind* upon the sounds that come into the ear. The music student cannot make substantial progress in his work without earnest and persistent study. Mere finger exercises cannot be a substitute for study. Practice, indeed, makes perfect, but it must be intelligent practice, and in nothing more so than in music. What relation is there between the musical concepts in the mind and the tones produced by the piano? "The piano is a photographic camera, making for us a picture of what we have written,—a camera so subtle indeed, that it pictures not things we can see and touch, but invisible things which exist only within us" (Tapper).

But we must not presume to make the piano think for us, as some unfortunately too often do. Instead of looking carefully through the pages of their new music, reading and understanding it with the mind, they run to the piano and with such playing-skill as they have they use their hands instead of their mind. This is wrong, and does much harm to the student. Before the hands and fingers can do their best work there must be intelligence behind them to guide and make effective every movement. The more knowledge we have, the greater the skill and power of our hands.

So, then, the music student must study diligently, not only his immediate subject, but as many other subjects of general knowledge as possible. Thus will his mind come in contact with great thoughts, and his whole being will be filled up with power. Thus will he widen and deepen his culture, he will become acquainted with the best and greatest things in the world, and the tone of his life will be correspondingly elevated.

When we study great music we come in contact with great thoughts, just as when we read a great poem, look at a famous picture, behold a magnificent building, etc., for all the great works of art are stored-up thought. As the placid mountain lake reflects only what is *above* it, so the works of the great musicians reflect only those great and lofty thoughts which stand high above the plain of common things and afford perpetual delight and inspiration to sympathetic souls. Thus, when we have gained some understanding and appreciation of music by diligent study, we not only think about what we play and hear, but we begin to inquire what thought the composition contains and what meanings, what lessons of life and duty it conveys to us. Thus we begin to listen with the inner ear to the beautiful thought-forms that filled the composer's mind. From the mechanical performance, from mere technique, we have risen into the higher regions of expression and interpretation. All this, and more too, is what comes from learning to listen and from cultivating both the inner and the outer ear.

Of the other senses and sense-organs, namely, taste, smell, and touch, little needs here be said. Touch excepted, they are of secondary importance to the musician.

Looking at the nervous system as a whole, we see here a mechanism admirably adapted for receiving and transmitting impulses from without to the soul within, and for giving expression to the conceptions, emotions, and volitions of the soul by means of the various muscular movements. The health and training of the nervous system are of the highest importance to the musician, and should therefore receive his constant and serious attention. No one has greater need than the musician of sound and well trained nerves that are ever ready to do the bidding of his will, to respond promptly and accurately to every solicitation from the outer world as well as from his inner world of thoughts and feelings—nerves that are truly the servants of his will, and in friendly alliance with himself,

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QUESTIONS.

1. Meaning of expression?
2. Subject of present inquiry?
3. What is the medium of expression?
4. Remarks about the nervous system in general?
5. Two main parts of the nervous system?
6. Give account of the several divisions of the brain.
7. Describe the spinal cord.
8. What are nerves, and how classified?
9. Facts about distribution of nerves?
10. Explain the sympathetic system, and its office.
11. What are end-organs?
12. Describe the structure of the eye.
13. Why is eye-training important?
14. What are the means of eye-training?
15. Describe the mechanism of the ear.
16. Theory about the office of the semicircular canals? Give objection.

17. Give account of the organ of Corti, and explain its office.
18. State facts about the range of the human ear.
19. Compare capacity of the ear with that of the voice.
20. State facts about vibrations beyond the upper limit of audibility.
21. Show that the art of hearing must be learned.
22. What about sounds in nature?
23. Give Schumann's rule about listening.
24. Why listen to the scale-tones?
25. Show that ear-training is a process of mind-training.
26. Why is it important to *think* music?
27. What is said of wrong methods of teaching and studying music?
28. Substance of Mr. Tapper's remark?
29. What of variety in the tone-world?
30. What is it to listen?
31. Why must the musician be an earnest student?
32. Why is general knowledge necessary to the musician?
33. Why should we study only great music?
34. Why should the musician have a sound and well trained nervous system?

CHAPTER VI.

Habit.

"By habit we mean a fixed disposition to do a thing, and a facility in doing it, the result of numerous repetitions of the action —a fixed tendency to think, feel, or act in a particular way under special circumstances" (Sully).

"An acquired habit, from the psychological point of view, is nothing but a new pathway of discharge formed in the brain, by which certain incoming currents ever tend to escape" (James).

"Habit is the involuntary tendency or aptitude to perform certain actions which is acquired by their frequent repetition" (Webster).

These definitions in a general way serve to denote the particular field of mental phenomena now under consideration. It is much better, however, for the student not to confine himself to any formal definition, but from practical knowledge of the facts in the case to frame for himself a *working* definition.

The phenomena of habit are familiar to everyone, and may be studied every moment of our conscious life. Whatever theory we may hold as to the connection between mind and body, there can be but little doubt that habit has a physiological basis, and hence Prof. James' phraseology "pathway of discharge" is to be taken in a literal sense. In all probability it represents correctly the facts in the case. But what is meant by "a pathway of discharge?" It means

the effect on the sensitive nerve substance, of the flow of nervous force, set in motion by mind in the cerebral hemispheres. When we speak of nervous force we do not make this identical with *mind*, but it is rather simply an *effect* of mind,—mind-power transformed into other modes of action. As chemical action in the battery-cell is transformed into an electric current which flows out through the wire-circuit of a telegraph system, so we may represent motor-currents as transformed soul-energy. Then we can literally speak of "pathways of discharge". To be sure, this is only a theory, but if it guides us aright in the study of facts, it serves an important purpose. We do not set up the theory for its own sake, but simply as a means for attaining to the truth; when we have found the truth we may cast away the theory.

A thorough study of the higher nerve-centres suggests the probability that these centres contain in their groups of cells certain arrangements for representing impressions and movements, and other arrangements for coupling the activity of these arrangements together. "Currents pouring in from the sense-organs first excite some arrangements, which in turn excite others, until at last a discharge downwards of some sort occurs" (James). Be this as it may, whenever any activity occurs between one group and another group of nerve-cells, between one centre and another centre, or between the various centres and their correlated muscular arrangements for the production of motor effects, the facts show that each time such activity is repeated the tendency for such activity to recur is increased. This fact is aptly represented by the word "pathway". The oftener we walk over a given path, the more marked, the more

deeply worn, the harder, the smoother, the less resisting it becomes, and, other things equal, the surer we are to keep on walking in that path.

So, habits are due to pathways through the nerve-centres and nerve-fibres. The currents of influence from outer stimuli pouring in through the sense-channels, being once in, must find a way out, for where there is action of any kind from outer stimuli, there is also reaction from the centres towards the outer world. These "currents in getting out leave their traces in the paths which they take. The only thing they *can* do, in short, is to deepen old paths or to make new ones; and the whole plasticity of the brain sums itself up in two words when we call it an organ in which currents pouring in from the sense-organs make with extreme facility paths which do not easily disappear" (James). There is implied in all this the property of *plasticity* in nervous substance on account of which certain after-effects remain when the exciting causes have ceased to act. Plasticity in a body means such a structure of its substance as will allow yielding to an influence without destroying its integrity. This property in some degree is found in all organic matter, but nervous tissue possesses it in a very extraordinary degree. To this property the phenomena of habit are due; this is the physiological basis for the effects of repetition of an action. Habit is thus not a capricious thing, but a *law* of our being, a law, moreover, which in an important sense conditions almost every other law of physical and psychical action in the human economy.

Repeated action creates a molecular disposition in the nervous substance. This is a principle of tremendous

consequence, as we shall see later on, and therefore it demands our close attention here. Prof. Wundt says: "Where we have no knowledge of the true condition of the molecular changes, in which practice consists, as is the case with the complicated structure of the nervous system, we have only the one general expression, which, however, has the advantage in contrast with the view of remaining material impressions, that it claims material after-effects, which continue at first, but with no practice gradually fall away; and do not consist in a continuation of the function itself, but in facilitating its repetition." These enduring changes or after-effects of nerve-stimulation we call *nervous disposition.*

These after-effects consist in certain changes in the arrangement of the material molecules by virtue of which a permanent tendency toward a given mode of action is produced within them. When a nerve has once been excited by the application of a stimulus there is produced within the nerve substance a tendency to act in a similar way upon subsequent stimulations. Every time the stimulation is repeated the tendency for a given nerve-action to recur, is increased. When impressions upon the brain cells vanish from consciousness they do not pass away entirely, but leave behind a permanent result, a certain disposition in the nerve substance which under favorable circumstances facilitates the reappearance of the original impressions.

Experience shows that a single sensation does not visibly change the sensibility of the nerves, and therefore apparently leaves no lasting impression. It is only when the sensation has been often repeated, at certain intervals, that a marked and lasting change

appears. "Every element becomes more suited to a certain function the oftener it is led by external conditions to exercise it. The frequent repetition of the same impression greatly facilitates the reception of a similar one, and the repetition of various sensations in a certain sphere of the nervous system renders possible the distinction of the finest differences in the force and quality of the received impressions. . . The frequent performance of a function lessens the amount of exertion necessary for a similar or more difficult one. . . Many phenomena prove that when a sensation is frequently carried through the ganglia cells in a certain direction, this direction will in future cases when impressions touch the same cells be preeminently disposed to act as conduct" (Wundt).

"It seems just as if impressions that repeatedly transfer themselves from one point to another put aside obstructions on the connecting paths, and make the way freer, smoother, and more traversible. . . . If we often combine a certain feeling or conception with a motion, the latter will finally take place involuntarily as soon as that feeling or that conception is called forth, and *vice versa*. Certain notes recall certain words to our mind, or the words, the notes, and we sing or whistle them lowly to ourselves. That bond which the practice of our central organs knits between various stations of feeling, conception, and motion, we call *habitude*. Stations which are in the habit of corresponding, answer each other's dispatches very promptly, while those of others are not answered at all or only with hesitation and doubt" (Kussmaul).

"Like a machine, which, if continually turned in the same manner and moved by the same driving spring,

receives a decided inclination and disposition to this mode of motion, the human soul receives a decided inclination and propensity for those modes of expression and feeling to which it has grown accustomed by repeated similar practices" (Resewitz).

"Habitude is not only a state, it is a disposition, a virtue. Habitude has the greater force when the change which has produced it continues or is often repeated . . . Repetition strengthens habitude; for an act even when it has not been performed more than a single time leaves a disposition which is the point for the departure of habit" (Ravisson).

Let these statements by authorities on the subject and coming, as they do, fresh from the psychological laboratory, be duly weighed and their bearing considered. The very important fact here to be emphasized and pressed upon the music student's attention is that all impressions he receives, all objects he beholds, all sounds he hears, all pictures he views, all images of beauty he cherishes in his heart, all thoughts that stream through his mind, all acts he performs, leave in his nervous and mental being permanent results as disposition or propensity to repeat his former states and acts with ever increasing facility.

Attention is also called to the fact that the principle here brought out is the foundation of all *skill.* Were it not for this thing of nervous disposition as result of previous acts and efforts it would not be possible to acquire skill of hand in playing, or doing anything else. Finger-training, ear-training, voice-training, and every other kind of training would be out of the question. No such thing as practice making perfect would be possible, for we should do the simplest act the hundredth time no better than the first

time. Then could we never learn to walk, or see, or hear, or talk; we should live our life in perpetual inexperience and helplessness and drop into hopeless imbecility. But the all-wise Creator has made us and the world in which we live on the principle of economy. As the disciples in the miracle of the loaves and fishes were commanded to gather together the fragments so that nothing should be lost, so in the economy of nature it has been decreed that nothing should go to waste. Everywhere energy, in its multitudinous forms and ceaseless round of activity, is conserved, not destroyed.

In the physical world, as in the mental, after-effects remain when the exciting cause has vanished. The beautiful colors of the fluorescent tube persist long after the electric current has been broken. Luminous undulations may be garnered up in a sheet of paper, ready to be revealed at the call of special reagents. A plate of dry collodion, after being briefly exposed to the sun's rays, retains for weeks in the darkness the effects of the indescribably delicate changes which have been wrought in it by the actinic power of the sunbeam. So "the well seasoned Cremona, which has been played upon by skilled hands, will reproduce the tones with superior sweetness and purity, on account of the secret molecular changes of which it has been made the subject of previous agitations from the bow of the violinist" (Ladd). Hence the *personality* which favorite instruments acquire by long usage; hence also the reluctance with which the owner of a fine piano allows another person to play on it. The doctrine of stored-up energy—physical, nervous, mental—is truly wonderful, and acquires new meaning in connection with this study of habit.

Habit in Education. We have spoken of the physiological basis of habit and have attained a broad foundation upon which to rise into some of its special applications. What has habit to do with education? Rousseau has said, "Education is certainly nothing but a formation of habits."

"Habit almost invariably goes farther than precept, and the teacher must ascribe most of his successes to the formation of habits. For the power of insight generally covers a single case only, while that of habit reaches through a whole life" (J. G. Curtman).

Lord Brougham has said: "I trust everything, under God, to habit, on which, in all ages, the lawgiver as well as the schoolmaster, has mainly placed his reliance; habit, which makes everything easy, and casts the difficulties upon the deviation from a wonted course." "Education deals altogether with the formation of habits. For it aims to make some condition or form of activity into a second nature for the pupil. But this involves also the breaking up of previous habits. This power to break up habits, as well as to form them, is necessary to the freedom of the individual."*

It is a wise precept of the Koran that the great thing in all education is to see to it that the habits of the child are of the right kind. It is a familiar educational maxim that as the twig is bent the tree is inclined; but this is nothing else than the philosophy of habit expressed in the simple language of common life. What the child's character, mental, moral, and social, will be depends on the habits he forms during the plastic years of childhood and youth, for every

* Rosenkranz, "Philosophy of Education," p. 35.

experience, every impulse, every emotion leaves a physical record and tendency in the brain and the nervous system as a whole. Character in its essential part is simply habit which has become fixed.

Habit is far the most powerful of all the educational forces; therefore its importance cannot be too strongly urged upon the educator. If the pupil is taught to act properly and then keeps on acting properly, by and by good manners become fixed habits with him; if he persists in doing right, after a while right doing grows into a firm habit; if he continues spelling and pronouncing words correctly, moving his hands and fingers correctly, and playing correctly, these repeated acts will grow into life-habits.

It is a saying in our language that "habit becomes second nature," and the Duke of Wellington said, "Habit is ten times nature." We can understand what he meant by this when we recall another remark of his while watching the boys at play in the yards of Eton School, namely, "There the battle of Waterloo was won." There, in his boyhood days, in the exercises of the playground as well as those of the school-room, was laid the foundation of his military training; there began the stream of habit, which issued in the cool, deliberate, thoughtful, powerful military leader, the hero of Waterloo. The habits formed on the playground became to him a power "ten times nature" in shaping his later life and achieving his world-wide fame. Oh, that every pupil and every teacher did but realize the tremendous consequences of habit in the process of education! By every act of our daily life, whether grave or light, unconsciously we are spinning the web of destiny, we

are making our own fates, good or bad, we are forming those habits which will determine our character and career.

The drunken Rip Van Winkle, in Jefferson's play, excuses himself for every fresh neglect of duty by saying, "I won't count this time." Ah! but it does count none the less; every single act whether good or bad, right or wrong, careless or thoughtful, counts with unerring certainty, and never a single item is allowed to go unheeded. Down among the braincells and in the nervous and muscular fibers every movement is counted and registered, every mistake is recorded in the form of a permanent disposition to do the same thing over again. Every act we do leaves behind it a permanent effect. The things that we do often and do habitually soon become "second nature." This means that wrong habits, if not corrected, inevitably organize themselves in our innermost nature into powerful forces of opposition which in some critical moment when we are desirous of achieving success will assert themselves with direful obstinacy and bring about humiliating defeat.

The great thing in education is to make our nervous system our friendly ally instead of our enemy. Happy is the man whose habits are his friends; woe to the man whose habits have been such as to bring his muscles and nerves in hostile array against himself! This is of special value to the music student. What is your musical education? A chain of habits. What is your life? What are you? A bundle of habits. Education means control of one's self—mind, nerves, body. It means that the natural and appointed servants of the mind in the execution of its desires, ideals, and volitions shall be ready and obedient as

well as intelligent. The importance of these facts and principles needs to be thundered into the ears of every music pupil, for evil habits are the rock upon which so many make shipwreck of their hopes and aspirations.

Avoid Bad Habits. My apology for calling attention afresh to this old and hackneyed subject is its vital importance and its vastly deeper meaning, on the basis of psychology, than has hitherto been realized by the majority of people. Why is it so important for the music pupil to avoid evil habits?

Because they are "second nature," yea, rather, "ten times nature;" and we know how powerful a thing nature is in human life and education. In a previous chapter we have seen that our nervous system is an organism for receiving impressions from the outer world and for reacting on these impressions. When we study child-nature on a psychological basis we soon become aware of how numerous and how powerful the native reactive tendencies, the impulses and instincts of childhood, are. It is the business of education to determine and direct into proper channels these natural reactions, to substitute for the evil and hurtful ones those that are right and helpful. It is the work of education to organize the elements of nature into forces for good in the development of the mind's capabilities.

This principle lies at the foundation of the Kindergarten method and the manual training idea, which one has called "the most colossal improvement of recent years in secondary education." To grasp this principle and apply it as an educating force is to understand the philosophy of education. These acquired reactions of which we have spoken are nothing

else than habits. All our life, so far as it has definite form, is but a mass of habits,—practical, emotional, and intellectual,—systematically organized for our weal or woe, and bearing us irresistibly toward our destiny, whatever that may be.*

Habit is a *law* of our being in consequence of the fact that we have a nervous system. In the words of Dr. Carpenter, "Our nervous systems have *grown* to the way in which they have been exercised, just as a sheet of paper or a coat, once creased or folded tends to fall ever afterward into the same identical folds."

"Ninety-nine hundredths or, possibly, nine hundred and ninety-nine thousandths of our activity is purely automatic and habitual, from our rising in the morning to our lying down at night." This is the meaning of the saying that "habit is second nature," and this also explains the reason why evil habits should so carefully be avoided in the rudimentary stages of musical education.

Evil habits should be avoided because of their irresistible power. Habit is tyrannical in its nature, and all the more so because it is insidious in its progress and influence. Says Montaigne: "Habit is a violent and treacherous schoolmistress. She, by little and little, slyly and unperceived, slips in the foot of her authority, but having by this gentle and humble beginning, with the aid of time, fixed and established it, she then unmasks a furious and tyrannic countenance, against which we have no more the courage nor the power so much as to lift up our eyes."

"Habit at first is but a silken thread,
Fine as the light-winged gossamers that sway

*James, "Talks to Teachers on Psychology."

In the warm sunbeams of a summer's day;
A shallow streamlet, rippling o'er its bed;
A tiny sapling, ere its roots are spread;
A yet unhardened thorn upon the spray;
A lion's whelp that has not scented prey;
A little smiling child obedient led.
Beware! that thread may bind thee as a chain;
That streamlet gather to a fatal sea;
That sapling spread into a gnarled tree;
That thorn, grown hard, may wound and give thee pain;
That playful whelp his murderous fangs reveal:
That child, a giant, crush thee 'neath his heel."

Habit has been called the "flywheel of society"; with greater propriety it is the flywheel of individual life. Observe that mighty engine yonder! Long after the steam has been shut off the machinery set in motion by the engine keeps on moving simply by the momentum of its ponderous flywheel. What the flywheel is to the machinery, habit is to human life and action. The machinery cannot stop until the regulating wheel lets it stop; so men cannot stop or change their course of life until the power of habit has been overcome. The confirmed drunkard, the professional gambler, the inveterate smoker, afford us only too common and sad examples. Beginning with single acts, habit is formed slowly at first, and it is not till its spider's threads are woven into a thick cable that its existence is suspected. So powerful is this effect of the constant repetition of actions, that men whose habits are fixed may be almost said to have lost their free agency. Their acts become of the nature of a fixed fate, and they are so bound by the chains which they have forged for themselves, that they do those things which they have been accustomed to do, even when they know they can yield them neither pleasure nor profit.

"Ill habits gather by unseen degrees,
As brooks make rivers, rivers run to seas."

—DRYDEN.

The delicate snowflakes high up in the mountains, falling softly, noiselessly, one by one, are small and insignificant things that can be destroyed by an infant's breath. But these same snowflakes, gradually accumulated from day to day, by and by form the mighty avalanche rushing resistlessly down the Alpine valley, carrying death and destruction in its way. So the small acts of daily life, taken singly, seem insignificant, but collectively they make the character and shape the destiny of men.

It is of the highest importance in what direction the stream of life starts out, and towards what goal it moves. Look at that boat in the Niagara River far above the falls. Slowly and indifferently it moves at the will of the rower. The waters are calm, there is scarcely a perceptible current, the boat can be easily turned this way or that. By and by it moves faster and still faster; it is more difficult now to change the course of the boat. Now it is in the death-grip of the resistless rapids, its doom is fixed, effort of muscle and agony of soul can avail nothing, a moment later as by unalterable fate the boat with its unhappy occupant is dashed into the abyss of ruin! See in all this the illustration of what habit is in education.

We should avoid evil habits because it is hard to correct them. Habit grows stronger with age and repetition, and character becomes set; therefore as the years go by it becomes more and more difficult to leave the old paths and turn into new ones. It is much harder to *unlearn* than to *learn*. If a crease has once been made in a sheet of paper, it is very hard to remove

it; be careful, therefore, that the sheet is folded the first time in the right place, so that the effect of the folding needs never be undone. The Grecian flute-teacher was justified when he charged *double fees* in the case of those pupils who had been taught by an inferior teacher. It is much more difficult to teach pupils who have been started wrong than those who have made no start at all, because pathways of mental and nervous activity have been made which must be unmade before there can be any real progress, and this unmaking is painful and difficult.

Our bad habits are thus expensive things; they cost us much money, time, and annoyance to get rid of them. Wrong habits are like diseases, they must be eradicated before good habits can be formed. They are like noxious weeds in a garden, they must be pulled up by the roots before useful plants can be made to grow in their place. We must stop using our minds, hands, fingers in a wrong way, and thus break up evil habits: we must begin doing the right thing in the right way and keep on doing this, and thus establish good habits.

Avoid the first mistake. There is a *first time* in everything that we do, and this first time is of immeasurable value in the matter of muscular, nervous and mental training. The *first* time largely determines all subsequent times. Therefore, when a new act is to be done, when something new is begun, our first efforts should receive our utmost attention and care—our *initiative* should be the strongest, most decided, most wideawake possible. The first start on the road of life determines the direction and the destination of the journey. The French maxim, "It is only the first step which is difficult," is to the point

and suggests many an important lesson. It is an old saying that "all beginnings are difficult." Habit may be defined as an action so often repeated that it repeats itself without thought. Hence the importance of repeating only perfection. The will must say, "The first step shall be perfect, and all subsequent steps or motions shall faithfully copy the first." Every repetition of imperfection is not only a loss in itself, but it delays and makes more difficult the formation of right habits.

Our chief anxiety should be from the beginning to *avoid* mistakes, rather than, later on, to correct them. It requires no more mental energy, no greater nervous power, to do a thing right than to do it wrong; but when once done wrong, it requires a great deal more labor to undo what has been done amiss than to do it the first time. "An ounce of prevention is worth a pound of cure." "Well begun is half done."

The first music lesson is a crisis in the pupil's life. O teacher, do you realize the bearing of the first lesson you give your pupil? How does the flywheel start? What is the course of the little rivulet which for the first time starts down the mountain slope? What is the pathway which the first discharge of nervous energy marks out for itself in flowing down from the higher brain-center through the fingers and out upon the key-board? The first acts leave behind in the cells of the nerves a permanent disposition to act in the same way as on the first trial.

Pupils are apt to think that little mistakes are not so serious; but from an educational point of view, it is these first little mistakes that are most serious, indeed. As a sheet of paper is sure to bend a second and third time where it was first creased, as a

repaired bone will break more easily where it was once fractured, as a scar in the skin will be more readily inflamed than other parts, so character is always weakest at that point where it has once given way, and those who have experience in the reformation of criminals know that it takes a long time for a moral principle once broken and restored to become so firm as one that has never yielded. This fact in moral character rests precisely on the same psychological basis as first acts in education.

Therefore, never make a false note, never strike a wrong key, for when you do this once you are liable to do it again. Have a clear mental image of what you are going to do; then see to it that this conception making its way out through the fingers into the keys of the instrument *starts* its path in just the right direction. Prof. Bain lays it down as an educational principle of primary importance, "Never suffer an exception to occur till the new habit is securely rooted in your life." If an exception is allowed to occur and the continuity of training is broken, not only is the advantage previously gained, lost, but there is inaugurated a new habit in the wrong direction which is the more difficult to overcome because it is a kind of victory over antecedent discipline. A Russian maxim says, "Habits are a necklace of pearls: untie the knot and the whole unthreads." Each lapse in the course of training is like dropping your ball of yarn which you have been winding up so carefully—you have to do the whole thing over again from the beginning. "Never lose a battle," for every gain on the wrong side undoes the effect of many conquests on the right side. Be sure you have a right conception of every step in your practice exer-

cise, and then make your fingers execute accurately what your mind holds in thought. Be sure of success at the start, never doubt it, for this attitude of mind will give strength and positiveness to the nervous discharge and this in turn will deepen the pathway of nervous action.

Be not anxious about your *genius*; it is what it is—nothing more nor less than your Creator has given you. But be intensely anxious about your habits; on that all depends; that will decide your success or failure in music, in life. You, whoever you are, with such talents as you may have, can do wonders, if you start right and work right. Listen to the testimony of a pupil in whose experience you may see the reflection of your own: "I have taken lessons of a great many good teachers, but all have told me that I never would be much of a player. I always felt there was some secret withheld from me which prevented me from becoming a pianist. From the teacher I now have I have learned to say, 'What I desire to be, that I can be,' and I have done more in one year than in all the rest of my life before. The secret is very simple. I was never taught to form habits; I was given exercises, but never told why or to what aim I should practice them. Now I find that conscious effort, intelligently directed, enables me to form a habit of playing a thing exactly as I would like to play it."*

A student who had spent three years in pursuit of his music studies at Leipzig, Germany, told the writer that his experience was precisely similar to that above described. Extensive observation among many students leads us to the belief that this exper-

*"The Etude," Oct., 1897.

ience is well nigh universal. It marks a radical defect in existing methods of music teaching. He who does not encourage his pupil to develop the gift that is in him and to cherish a noble ambition to make the best use of himself and directing his efforts intelligently, cannot be considered a good teacher.

Says one, "The days of *instruction* in music are over and the time of *education* in music has come. Our chief aim is to develop, to educate the musical sense of the pupil. Our essential service to the pupil consists in getting him to think for himself." Among the foremost thinkers and teachers of our time the great principle of economy of habit is gradually coming to be recognized at its proper value. Froebel's grand idea, which germinated in the Kindergarten method of primary instruction, is bearing fruit in our day in promoting rational methods of teaching music. Habit is the great conservator of mental, nervous and muscular energy. As starts the tiny rivulet, so will flow the fixed stream; the forces conserved and directed by right habits in the beginning of a musical education will issue in gratifying results by and by. Hence the wisdom of centering special attention upon the *first music lesson.*

A word to the teacher, by way of a friendly side remark. In other respects, than those just mentioned, is the first lesson a crisis point in the pupil's experience; to what extent, you may not realize, possibly never be able to know. What impression do you make on your pupil? Remember the educational maxim that there is no *impression* without a corresponding *expression*; every stimulation from without has its attendant and inevitable *reaction.* Is your manner such as to *encourage* or to *repel?*

Is it haughty, cold, unsympathetic? Remember you are dealing with a tender soul, that needs sunshine, warmth, sympathy; it is like a rosebud, which will not open and unfold its beauty and possibilities in a chilling, biting atmosphere. When Liszt was but twelve years of age he was advertised to give a concert; and upon the solicitation of Schindler, Beethoven went to hear and encourage this youthful prodigy. When the little Liszt came out on the platform, he saw Beethoven sitting in the front row. Instead of being unnerved by the great man's presence, it was an inspiration to him, and he played with great fire and abandon. In the storm of applause which followed, the great master was seen to step up on the platform and catch up the little fellow in his arms and kiss him on both cheeks. Liszt never forgot this incident and used to repeat it with great pride, for he felt that the master had set the seal of greatness upon him in that kiss*.

Beethoven's kiss was a very little thing in itself, but great in its consequences; it was a timely mark of appreciation, an act of encouragement; and who knows the far-reaching influences of these little acts of kindness and love in the educative process, in the history of a soul's struggles to attain its unfolding into manhood or womanhood? Benjamin West used to say, "A kiss from my mother made me a painter." A kiss or a smile of sympathy is a far more potent factor than a cuff or a frown in the business of developing a pupil's possibilities. Sympathy is a grand essential in the qualification of the teacher. He needs to know not only human nature, but he must understand *pupil* nature, which is something quite peculiar.

* Gates, "Anecdotes of Great Musicians."

True sympathy recognizes the pupil's possibilities, as well as his difficulties and discouragements; and it knows how to speak the timely words, which are as "apples of gold in pictures of silver," or do the friendly act, which is as the refreshing shower to withering vegetation. To teach pupils well and to get the stream of their energies started in the right direction they must be *loved* much.

Love is a great thing in the work of opening the latent powers and beauties of the soul. Loving sympathy is a never-failing means of getting into the heart of persons and things. It is so in the higher realm of art-interpretation—in dealing with the products of painting, sculpture, architecture, music—in the interpretation of the Holy Scriptures. The "light and sweetness," the beauty contained in the poem, the picture, the statue, the musical composition will yield to the touch of love when they yield to nothing else. The great forces of mind and heart, the hidden riches of literature, art and common life, in all ages and countries to the end of time evermore yield promptly to the beckoning magic wand of love. And it is so in the art of teaching, in the opening of the mind to truth and of truth to the mind. He who knows the value of these educational principles will appreciate also the bearing of the teacher's manner at his first meeting with the pupil, on the pupil's subsequent career.

Suggestions for the Formation of Right Habits. A few hints in regard to the formation of useful habits may not be out of place, and may prove of service to the student.

First among these, as truly conditioning all the rest, must be mentioned *a strong and decided ini-*

tiative. As this in substance has just been explained, we need here simply to give it mention.

Secondly. *Practice concentration of thought and intensity of effort.* The wise man long ago formulated this principle for us in words familiar to everyone: "Whatsoever thy hand findeth to do, do it with thy might" (Eccl. 9: 10). Herein is stated the first law of success; those who heed this rule are likely to succeed. This does not mean doing things with one's might on particular occasions or by spasmodic efforts, but it means habitually so doing. When the piano player, or organ player, or violin player concentrates all the energy of mind and heart and hand upon his work, success is assured, for thereby is generated such a power of doing the right thing in the right way that it will overcome all opposing difficulties. The Apostle Paul made it his rule, "This one thing I do," and this explains largely the wonderful success of his labors. Charles Dickens once said: "Whatever I have tried to do in my life, I have tried with all my heart to do it well. What I have devoted myself to, I have devoted myself completely. Never to put one hand to any thing on which I would not throw my whole self, and never to affect depreciation of my work, whatever it was, I find now to have been golden rules." Of king Hezekiah it is said, "In every work that he began, . . . he did it with all his heart, and prospered" (2 Chron. 31: 21).

All these sayings rest on true psychological ground and may be explained in the light of well known principles. When the rays of the sun are scattered they are not most effective for doing work, but when they are converged to a focus by a burning glass they become powerful enough to ignite combustible sub-

stances. When the electric fluid in the thunder-clouds is dispersed by many metallic points raised on the surface of the earth there is little danger from lightning, but when the fluid is allowed to accumulate it acquires such a degree of tension as to cause the dreaded thunder-bolt to leap from the sky to the earth carrying death and destruction in its way. If the water in a great reservoir is allowed to escape in ten thousand little rills it will all run off to no purpose, but if these rills are turned into one stream a mighty torrent is produced which no human power can resist. So it is with the energy of the human soul: dissipated, it can accomplish little; but turned upon one point, it performs wonders. In the case of the piano player our principle finds an important application. Concentration of effort is a substitute for long and wearisome hours of practice. Rubinstein being asked by a young lady pianist how many hours it was necessary to practice each day, replied that for Americans, and especially ladies, an average of three hours a day was the extreme limit, and less rather than more should be the rule. Jacobsohn, the violinist, said that he practiced only one hour a day, but that this hour is so intense in nervous exertion that he is completely exhausted and dripping with perspiration at the end of that time.

These sentiments are founded on the nature of mind and are confirmed by experience. The human mind cannot concentrate its good and powerful thought on any one subject for more than three or four hours out of the twenty-four. Education trains us to get the greatest results out of the least expenditure of effort. Those who practice many hours a day must put forth painful and long-continued effort, and they

get but meager results. Concentration is economy of mental and nervous power, and also of time. One hour with concentrated thought is equal to four hours with weak and dissipated thought. Therefore, reduce the hours of work and waste by concentration of thought. Then will more of the pupil's time be left for other things in the way of improvement in general culture; then will the habit of concentrating all his powers become firmly established and effort in every direction will become many times more effective and easy.

"Applied concentration makes a musician, an artist, a poet, a philosopher." It is a great truth, and worthy of all acceptation. The degree of success a man achieves and the rank he attains in any calling depend more on this 'applied concentration' than on the gift of genius or on accident. When he has learned to bend his whole attention on the details of his work he is on the highway of success in his chosen calling. A powerful central nerve current is necessary for a free hand and finger movement, for sure action, for a steady stroke, for a tender touch, for self-control and an easy, graceful pose at the instrument; it is a sure antidote for nervousness and trembling.

Among the incidental requisites to such a powerful nerve current may be mentioned, first, *proper nourishment*, which will secure a good fund of rich arterialized blood, which in turn imparts tone and a healthy glow to the bodily members. Then, there should be free circulation of the blood, so as to secure an equitable distribution of the life-forces carried by the blood, and relieve all tendencies to local congestion in some parts and the absence of blood in others, which gives rise to an uneasy, restless, excited state of mind and

body. Proper exercise must be attended to—vigorous, active exercise out in the open air and in God's unclouded sunshine—exercise that will open the pores of the skin, send the color to the cheeks, and bring a delightful glow to the whole body. Having taken such exercise and having rested a while, the player will resume his work at the instrument with better control of muscles and nerves and he will be able to employ such mental powers as he may possess to much better advantage than he could before. Besides all this, he will really enjoy his practicing. Some one tells us that his remedy for stage-fright is to administer to the afflicted one a severe slapping on the bare back until the skin smarts, and that this remedy never fails. The principle involved is the same as that above described, and rests on good physiological ground.

But the great requisite is *undivided attention.* "This one thing I do,"—on *one* thing I fix my attention, to *one* thing I devote my whole being, into *one* thing I pour the whole stream of my activity, mental and physical. "Be a *whole* man at everything", was the advice of a celebrated Englishman to his son at school. It is the lack of this wholeness of purpose and energy which distinguishes the half-hearted and blundering, the faltering and the weakling, from those that win the victories of life. To make all the nerve-forces flow in one channel is to make the central current powerful and effective, whilst to allow numerous side branchings is to weaken and dissipate the effect. Says a shrewd American essayist: "The one prudence in life is concentration, the one evil is dissipation; and it makes no difference whether our dissipations are coarse or fine—property and its cares,

friends and a social habit, or politics, or music, or feasting. Everything is good which takes away one plaything and delusion more, and drives us home to add one stroke of faithful work."

The culture of a healthy, vigorous soul is like that of a tree. The prudent gardener does not suffer the sap to be diverted into a thousand channels merely to develop a myriad of profitless twigs; he prunes the off-shoots, and leaves the vital juices to be absorbed by a few vigorous fruit-bearing branches. Mental dissipation is peculiarly our American sin; we squander our energies upon a distracting, bewildering variety of objects, instead of condensing them upon one thing. The general who scatters his soldiers all over the field thereby ensures defeat; so he, whose attention is forever diffused through so many channels that it can never gather force on any one point. Notice those clouds of steam as they rise in the sky. Nothing is more powerless; they are as impotent as the dewdrops that fall nightly upon the earth. But concentrated and condensed in a steam-boiler, they are able to cut through solid rock and to hurl mountains into the sea. What made William Pitt the so-called "heaven-born statesman?" It was the marvelous power of concentrating his powers; it was the habit of bending all his energies upon the thing in hand. Whatever he did, he did with all his might. With him there was no half vision, no sleepy eyes, no dawning sense. "All his life he had his wits about him so intensely directed to the point required, that it is said, he seemed never to learn, but simply to recollect . . . Is it strange that such a man went straightway from college into the House of Commons, and in two years to the Prime Ministership of Great Britain,—reigned,

for nearly a quarter of a century, virtually king,—and carried his measures in spite of the opposition of some of the greatest men England ever produced?" The simple secret of his success was that all the power of his soul was concentrated on one purpose.

Concentration of soul-power will do wonders for all workers, as it did for Pitt, Luther, Bismarck, Haydn, Mozart, Beethoven, Händel, Bach, and all the rest of the world's renowned worthies. Be not anxious about your genius,—it is what it is,—do not stand lamenting the parsimony of nature in the bestowment of gifts upon yourself, for that will avail nothing. But *be* attentive, diligent, soul-centered *workers*. "Why stand ye here idle all day long? Go, work in my vineyard," is heaven's call to you whoever you may be. Concentrate your powers of mind and soul and body on the one purpose of your life—that will tell the story, that will decide whether you shall attain an honorable rank in your calling or remain forever a common drudge.

Industry, application, labor are necessary in order to achieve excellence in music as well as in painting, sculpture, and literature. Remember Mr. Wirt's motto, "There is no excellence without great labor." Before a concentration of your powers, before determined effort, before unremitting toil and application and industry your bug-bear difficulties will vanish and your defeats will be organized into victories. Händel was an indefatigable worker. His biographer says of him: "He braved everything, and, by his unaided self, accomplished the work of twelve men." Haydn, speaking of his art, said, "It consists in taking up a subject and pursuing it." Mozart declared that "work was his chief pleasure." Beethoven's favorite

maxim was: "The barriers are not erected which can say to aspiring talents and industry, 'Thus far and no farther'." John Sebastian Bach said: "I was industrious; whoever is equally sedulous, will be equally successful."

All the great composers have been earnest students and hard workers. Genius is no substitute for labor. "Eternal vigilance," it has been said, "is the price of our liberty:" it is also the price of our success in music. The lives of great composers teach us that they went about their tasks willingly and enthusiastically, doing well each task as it came and being content with moderate progress. "Great men take short steps carefully," no matter how rapidly they are to go. Robert Schumann wrote, "Success comes with tiny steps." These facts and utterances should bring comfort to the disheartened and kindle courage in the timid and despairing. Perchance you have but *one* talent; then find it, prize it, improve it by faithful, earnest, conscientious work. Know that every step of the way, every effort, every earnest endeavor brings its sure reward. Stroke after stroke, year after year, if you go on patiently, the habit of industry, of concentration, of careful, thoughtful work, will become more firmly fixed and also more easy.

If you cannot accomplish as much as the masters, you need not despair; you can still do a great deal—far more than you think. If men give their whole attention to a subject, concentrate all their power upon their work, they will be able to accomplish much; on the other hand, if they give only a few occasional minutes and desultory efforts to their work, they will accomplish but little. If you expect to make your music a success you must give time and labor

and undivided attention to it. Set high your aim, then go forward courageously in pursuit of it. Lay deep the foundation, start the current of energy in the right direction, see to it that the paths down among the brain-cells are being marked out in the right way, concentrate all your forces into a powerful central current, and never doubt your ultimate success. "It is a beautiful arrangement in our nature that the reward for patient, faithful work comes silently to us, and often we do not know of its presence. But some day finding ourselves stronger, we look to know the cause of it, and we see that the faithfulness of past days has borne precious fruit."*

But such a course of training and habit-forming as we are urging here requires great *will-power*. Yes, indeed; let us settle this with ourselves from the start. No one becomes a great musician without vigorously willing to be such. As in a great manufacturing establishment it is the powerful engine hidden away somewhere in a room by itself, that drives all the machinery; so in the busy life of the brain worker it is the powerful *will* behind all, that gives motion and direction to the nervous forces, to the muscles, to the hands, to the whole being in all the routine of daily exercises. The *will* conditions almost everything in the history of art-achievement. If we have simply *will* to be and do something, we are already on the highway of success. Let us try to understand this as music students in the matter of forming habits of concentration and attention: it will prove a talisman to our success. "Where there is a will there is a way." Do we understand what this really means? Do we *realize* the truth of this old maxim, so as to become

* Tapper, "Musical Talks," etc.

to us a working rule? On all sides we find limits to our power; still it is generally true that he who intensely wills to do a thing finds a way for its accomplishment. "An intense desire itself transforms possibility into reality. Our wishes are but prophecies of the things we are capable of performing; while on the other hand, the timid, feeble-willed man finds everything impossible because he believes it to be so. To resolve upon attainment is often attainment itself."

Nearly all great men have been remarkable for their great energy of will. Napoleon's wonderful success was due not more to his vast military genius, than to his almost super-human will. "Impossible," said he, "is a word only to be found in the dictionaries of fools." When told that the Alps stood in the way of his armies he replied, "There shall be no Alps!" and the Simplon Pass was the result. Dr. Thomas Arnold of Rugby fame said, "The difference between one boy and another consists not so much in talent as in energy." And Sir Thomas Fowell Buxton has given this valuable testimony: "The longer I live, the more I am certain that the great difference between men, between the great and the insignificant, is energy, invincible determination, an honest purpose once fixed, and then death or victory. This quality will do almost anything in the world, and no talents, no circumstances, will make a two-legged creature a man without it. . . I am sure a young man may be very much what he pleases."

These earnest, thrilling words coming from such sources, deserve to be heeded and treasured by the student: they will prove helpful, they will ennoble his life and kindle inspiration to work. To think we are

able to be something is itself a long step towards the realization of our wish. "The truest wisdom is a resolute determination," was one of Napoleon's favorite maxims. Have the courage to will something noble and worthy of yourself, and then follow up your willing with determined, persistent, concentrated effort, and what may you not achieve? Be earnest and brave, and have faith in your ability. "Woe unto him that is faint-hearted," says the son of Sirach. A good old German proverb expresses admirably the same sentiment, "Den Muthigen gehört die Welt."

"Resolute determination in the pursuit of worthy objects is the foundation of all true greatness of character. Energy enables a man to force his way through irksome drudgery and dry detail, and carries him onward and upward in every station of life. It is not eminent talent that is required to insure success in any pursuit, so much as purpose—not merely the power to achieve, but the will to labor energetically and perseveringly. Hence energy of will may be defined to be the very central power of character in man—in a word, it is the man himself. It gives impulse to his every action, and soul to every effort. True hope is based on it, and it is hope that gives the real perfumes of life."*

The great thing willed, the good purpose once formed, must then be carried out with alacrity. "In life nothing bears fruit except by labor of mind or body." The statement is grounded in basal facts of human nature. He who allows his application to flag, or neglects his work on frivolous pretexts, is on the sure road to ultimate failure, because the habit of doing so as irresistibly carries him to that end as the

* Smiles, "Self Help."

rapids carry the boat once in their grasp over the falls. Every task should be undertaken in a whole-hearted way and as a thing not to be omitted on slight occasion. When work is habitually done in this way it will soon lose its drudgery and will become easy and pleasant, for concentration of energy, application, holding the will to a steady purpose are habits, and like all other habits, become second nature after a time. If we have formed habits of allowing our minds to run from one thing to another without direction, we must not be surprised if by and by it becomes well nigh impossible to hold them to any one subject for an appreciable length of time. On the other hand all valuable habits are formed by the exercise of voluntary attention.*

Thirdly, Give Thought to What You Do. Thoughtlessness is the great enemy of progress in all branches of study and pursuit; it is the giant evil that is responsible for the great majority of mistakes which cause so much annoyance and prove so expensive and disastrous. Thoughtlessness is principally a bad habit, and moreover the parent of an innumerable progeny of other evil habits. It is the evil spirit, which returning to the house whence it had been cast out and finding the house unoccupied, took unto itself seven other evil spirits, and the latter condition was worse than the former. Some one has said that "the harm of the world is done by two forces,—by evil thought and by thoughtlessness." Observe that *thoughtlessness*, that is, the absence of thought, the vacant, unoccupied state of mind, is one of these harmful forces. It is a truth of vital importance to the music student. Many are disposed to regard this

* Buell, "Essentials of Psychology."

matter lightly and even to speak apologetically concerning it, as if it were a matter of course and not attended by serious consequences; but in the light of psychological principles it is in reality a very serious thing. What pathway does the thoughtless act make for itself among the braincells? That in a large measure will determine subsequent acts.

No one can afford to sit down to his instrument and let his fingers wander listlessly over the keyboard while his thoughts are roving idly about. If only he could see the mischief that meanwhile is being done down among the braincells and in the nervous and muscular fibers he would be startled and perhaps cured of his fatal error. When the hands and fingers are not guided by careful thought they perform many unnecessary and injurious motions which soon grow into second nature and thus effectually bar the way of progress in the right direction; instead of increasing one's power and effectiveness of manipulation, they weaken him; they are just so much precious nerve-force wasted and worse than wasted, they are like the minute worm holes in the dyke which little by little make way for the influx of the destructive ocean billows. There is great need of earnest thought in the ordinary hand and finger exercises which are too often performed in the most mechanical and indifferent kind of way. We know, alas! too well what the results are. The music which is performed without thought is certainly never the highest order of music, and the work at the piano which proceeds without discriminating thought is not the best kind of work. Nothing can be done well without thought. All excellence, whether in common manual labor, in art, in literature, in music is the product of intelligent thought.

The practical lesson from all this is to avoid listlessness, absent-mindedness, thoughtlessness while practicing exercises. No teacher should allow his pupil to proceed with the lesson if his thought is not centered upon the exercise, for reasons apparent to all. Listen to the earnest words of Dr. Mertz: "Never practise listlessly; always have your whole mind and heart on your work, Know *what* you do and *why* you do it."

The hand is the medium through which the musical thoughts of our hearts flow out into the key-board in the act of playing, or into the notes in the act of composing a piece of music. The hand is the interpreter of the mind; in art products, it is the grand outlet of thought, the highway of soul-power, the medium of expression. In order that the hand may be an efficient servant, it must be trained and kept under control. But how is this done? *By careful thought.* It is well enough to keep practicing until certain movements of the hands and fingers become automatic; but the best work of the hands and fingers is always done when they are directed by the *thought* of the player. Music which is performed wholly by automatic movements is of the kind that the organ-grinder grinds out of his music box—it is sound, but lacks soul,—lacks expression, because there is no thought to express. Such also is the music which is nothing but that kind of technique which requires no thought on the part of the player in the act of performing it.

Who is the great pianist? Not he, who can beat on the keys with the greatest force and produce the greatest volume of sound; a common stone breaker can do that. Who is the great violinist? Not he,

who can perform all kinds of odd movements, cut up all sorts of capers on the poor, afflicted, long-suffering strings of his violin. Let not appearances deceive; *that* is not art; that is the merest sham of art. Who is the true painter-artist? Not he, who can make a loud display of colors and sketch fantastic figures and strike startling poses. Who is the well-dressed lady or gentleman? Not those, who attract the attention of everybody on the street. He is the great *pianist*, the great *violinist*, the true *painter-artist*, who has his mind first of all filled with great thoughts, lofty and noble ideals, and who, by many years of thoughtful training, has taught his hands to obey the commands of his will in the effort adequately to express his thoughts and ideals, and interpret them in terms of common simple life. Oh! one grows weary of all this half intelligent twaddle about musical *artists* in our day. True art is never demonstrative. As the true artist approaches nearer and nearer the heart of his subject, he is less disposed to affect brilliancy. The masters are quiet and simple in proportion as they become acquainted with the higher beauties of their art. It is with them as with mountain climbers—in the valleys and low foot hills they may be gay and noisy, but when they rise into the sublime heights they become silent, serious, thoughtful.

What is it that makes our great masterpieces of painting, sculpture, architecture, poetry, music so grand and beautiful and lasting? It is the *thought* they contain and express; behind these great works is always a *greater soul* with its precious thought-treasures. To such souls demonstration and affected brilliancy are as foreign as boisterous garrulity or idle jesting is foreign to the sublime mountain peak.

When we as art students, as makers or hearers of music, come to rest our judgment upon such ideas of art and artists, then are we not far from the true kingdom of art—all else is false and unworthy the name. So much by way of parenthesis.

Our remarks have brought into view a principle, which we must pause here to apply. We have said that everything should be clearly thought out in the mind before the hands are called on to act. But what does this suggest as to *methods* of learning music? We answer by asking another question, Is that a normal, a rational method which sends the learner, the first thing he does, to the piano and bids him hammer away at an etude of which he has not a single intelligent idea and to which he has not given a moment of thought? How can one do thoughtfully that of which he has not a single thought? How can the hands be guided by thought where there is no thought in the mind about that which the hands are to execute? Will you first set the hands and fingers into a hit-or-miss kind of movement with the hope that thought would make its way up through the fingers into the empty head and heart? Vain hope! Idle delusion! Fatal error! Reverse the order; follow nature. First fill the mind and heart with *thought*, with *ideas*, and then let these flow down from the higher centers through their appropriate motor channels and out through the hands and fingers upon the keyboard. Manifestly the pupil should first give his thought to the exercise, *study* it, *learn* it, find out what it contains and what the composer wishes to convey by it; when he has done this he is ready to begin the practice of it at the piano; not before.

Don't take your new piece to the piano to try it

over, but rather sit down in some quiet corner and go over it mentally. Study out its inner meaning, its conception, its harmonies and effect. Then go to the piano, and, with this mental picture vividly photographed on your mind, endeavor through the exercise of will-power, to make your fingers perform it as you have conceived it. Your first attempts will naturally prove unsatisfactory, but this will be the fault of the hands and not of the brain. The practice of reading over mentally a composition time and again cannot be too earnestly recommended. That mental conception of music, which is everything in playing, is frequently to be obtained only in this way. So many players devote so much attention to technique that the most you can say of their pieces is that they are *executed* (as one *executes* a criminal), not-played.* There is too much bodily exercise "which profiteth little," too little brain work in the average music pupil's practice. The learner should *study* the piece he is to practice, he should think musically. "Pupils often practice for months upon a piece without really knowing a single period of it; their practice calls into exercise not a single idea, not a single effort of mind to guide the fingers and give them certainty of movement, firmness of stroke, or delicacy of touch; it consists in mere mechanical playing of the notes, no impression whatever being made upon the brain, for the *mind has not listened*, the eyes have simply looked to see that the fingers struck the correct keys." Such work is waste of time, waste of nerves, waste of muscle—it never makes musicians. If pupils were taught to *study* music, there would be more musicians, and fewer playing machines, fewer organ-

* "The Etude," March, 1897.

grinders and piano beaters. "In the mad rush after technique the brain has been forgotten, the mind has been neglected; it has never learned the mysterious language of sound and therefore cannot understand the printed music except only as the music is interpreted by the fingers, and what kind of interpretation is that which knows nothing about the thought contained in the printed characters?"

Bring Intelligence into Your Work. What is meant by this? Broad, general intelligence is necessary for success in music as well as in anything else. A few years ago a different opinion prevailed; it was thought that the music student did not need thorough intellectual training, classical culture, either because he was a genius, or else because his work was entirely technique. But this is all a mistake.

Knowledge is power to the musician just as it is to everyone else. To make a first-class musician there is need of a high order of knowledge, not simply of his narrow specialty, but of all the subjects that belong to a well balanced education. What comes from the consciousness of knowing things thoroughly? A calm, collected mind, a steady nerve, a firm hand, an easy pose, a graceful manner. Knowledge expands and strengthens the mental faculties, controls the feelings, guides the will, and brings the entire life into harmony with its surroundings. You need something more than knowledge of notes and of musical terms. There are other worlds than that in which you have your special calling. Broad fields containing rich treasures lie all about you and invite your investigation. Be taught by paintings and sculptures, buildings and landscapes, flowers and poems, mountains and rivers, minerals and animals, clouds and stars,

men and nations—the thousand interesting things that make up the environment of your daily life—and you will be a better and happier musician for the knowledge you thus gain.

How is it possible to interpret the thought of the great masters, contained in their compositions? Only by getting into the same standpoint from which they looked out, and listened to the sounds from the world of harmony. Beethoven thought that three things were true of his symphonies: "First, that they are the product of his mental activity—the result of the organization of his whole experience; secondly, that his mental activity involves all the principles which are common to men and which enable one to explain his mental activity to another; thirdly, that his symphonies epitomize his knowledge of the thinking, feeling, and willing mind as known to him in self-consciousness." The works of Beethoven are the stored-up results of all the individual heart-beats, all the individual acts of memory, all the glorious pangs of feeling, all the efforts of will which passed through his conscious experience in the course of life. All this means that to understand and appreciate Beethoven's music and then to interpret it to others, one must be in sympathy with the experiences of his life—must, so to speak, live his life over after him. But how can one do this? Only by sympathetic study of the things which he experienced, the things which made up his life, the things about which he was thinking, the things that he loved. Hence musical biography is a study of great practical value to the music student.

Our musical appreciation is the index of our knowledge of the processes involved in the develop-

ment of musical art. To appreciate fully a fine piece of music we must know how that piece grew in the mind of the composer. How do we come to an appreciation and a right interpretation of a fine poem? What is it to understand literature and to perform the office of literary interpreter? Not simply to know the meaning of the words, to be able to construe the phrases, clauses and sentences, to explain the figures of speech—it is all this, and much more. An intimate acquaintance with the author's personal history is necessary. There is no surer way to get at the secret moulding principle in a great literary production than through loving sympathy with the author. It is so also in the study of musical compositions.

Music, perhaps more than any other subject, requires a high order of intellectual and aesthetic maturity in order to judge aright of its merits. A musical composition is, even to a greater extent than in the case of a poem, the embodiment of the composer's personality. "The ease and gracefulness of Mozart's music reflects the predominant mood of the man; the passionate intensity of Beethoven makes his music without a rival in this respect; the lofty, but unregulated genius of Wagner's music is a thorough reflex of the ambitious and persevering opera-writer, stage manager, and master of orchestration; the lovely tone-forms, the beautiful picture-music of Schumann reveal the poetic, dreamy character of the founder of the modern romantic school of music." Our appreciation of Beethoven's symphonies is intellectual as well as formal; the very character and life of the author are woven into their luminous texture and constitute the background for their beautiful figures. But such an intelligent appreciation and such a highly cul-

tivated judgment imply extensive general knowledge and numerous points of contact with the author's experience.

I cannot forbear reproducing here what another has so pointedly written. Good music implies the training of the mind. Only they can appreciate the *classics* who have something that is classic within them. Some players choose true music with pure thought in it, and do their best to play it well after the manner called for by the composer. Their aim is to give truthful expression to the music of a good writer. Other players select music, which is of a showy character, with much brilliancy and little thought in it. Their aim is not to show what good music is but show *themselves*. We must know the best,— that is what music-culture means,—and we must work for the best, for the truthful music, not the brilliant and vain. When we seek only the vain kind, we display poor taste. It is in music as in dress,—the flashy and showy is always indicative of an uncultivated taste. As we become better acquainted with true music we find it more and more interesting, and it keeps saying new things to us. We go to it again and agnin, and we always get new meanings. As our intelligence grows and our taste improves, the truly classic music yields new beauties. It is like the light in a beautifully cut gem, it seems that we never see all it is—it is never twice the same; always a new radiance comes from it.*

Enlarge the Field of Ideas. The musician has need of broad and accurate knowledge so as to make just discriminations. He would not play Bach and Beethoven in one and the same color, nor would he inter-

* Tapper, "Musical Talks," etc.

pret Schumann as he would Mendelssohn. Technique is necessary, but technique is only the beginning. A reliable technique is entirely under the control of the mind, and should have for a foundation a scholarly education, both musical and general. The study of musical history is earnestly recommended. No student can neglect this without serious loss. The present can be understood only in the light of the past. It has been said that "history is a great painter, with the world for canvas and life for a figure. A cultivated reader of history is domesticated in all families: he dines with Pericles and sups with Titian."

The great musical works that we possess are a heritage from many years and from distant lands. "From the days when men first undertook to give order and system to the scale tones; from the days of the monochord, of the Humae, of the two-line staff, the art of music has been stepping forward, slowly at first, as a child, then faster, as strength was gained, until at length it hastens so that we marvel at its development. . . . In the history of music from the days of Luther to our own time, we see the history of mankind. . . No one can fully grasp the significance of compositions by great writers who does not comprehend their place in history, for the reason that the individuality which composers put into their music is formed by sorroundings which can be discovered only in the pages of history. The era, the relationships, the surroundings of a writer must inevitably enter into what he produces, and, accordingly, to judge the writer well and understandingly, one must know the man in all his life-phases.

Close and careful study is necessary. Read the best books and magazines, study the literature of your

special subject, read the best poetry, read general history as well as musical history, give attention to various other branches of knowledge, such as acoustics, physiology, psychology, botany, aesthetics, criticism, etc., etc.

But you say you have not time for all this. Improve the unoccupied minutes and there will be time enough to fill the mind with extensive and useful knowledge. The great thing is to get your mind to work and to keep it constantly at work. Only cultivate once a studious habit and a taste for literary pursuits and then all objections as to lack of time, opportunity, library facilities, etc., will vanish. Where there is a will there is a way. A little system and much perseverance will do wonders.

Fourthly, Practice Constant Repetition. An old Latin proverb says, "Repetition is the mother of study." If this be true of literary studies, it is doubly true of musical studies. To keep bright what we have polished, to retain what we have acquired, to deepen and keep smooth the pathways marked out, we must constantly repeat our former exercises. Whenever mental acts are often repeated, their corresponding brain-cells are thereby made stable and vigorous by the same law that gives strength to our muscles by proper exercise. An arm carried in a sling becomes weak, a muscle unused soon grows flabby; so also the brain-cells. If, out of a hundred ideas, the thirty-fifth, e. g., has been repeated more frequently than the rest, the brain process corresponding to that particular idea is most likely to gain recognition in consciousness. We can picture to ourselves a continuous struggle going on among our mental images,—the weaker ones must give way; the vigorous, well

grounded images survive. It is a difficult task to learn a foreign language so as to speak it fluently, but constant repetition fixes word after word, sound after sound, so firmly in the mind, that we can recall thousands of words and sounds with the greatest ease and with little danger of forgetting. Because of the natural law that everything tends to grow weak by disuse, muscle and mind alike, we should so regulate our mental life that we are compelled to make constant use of the facts already gained.

To this end a wide-awake literary club among music students is a good thing; it gives an occasion to make use of the results of reading or study on some special subject, it stimulates the members to a wholesome rivalry, and it calls the mental faculties into exercise. A very entertaining and instructive programme can be carried out at each meeting, giving both pleasure and profit to all who take part. Conversation is a profitable exercise. If we talk over, with some sympathetic friend, what we have read, we thereby refresh our knowledge and impress it on our own minds more deeply, for the conversational way of putting things demands that we first have clear-cut and sharp images of the things we would communicate, and then, in the act of communicating, we gain the additional advantage of repeating these images, thereby fixing them more firmly.

We say, practice makes perfect, and all this rests on the principle of repetition. By a wise economy of our nature the effects of previous efforts are not lost but conserved as disposition in the nerve substance; repetition of the act strengthens this disposition till by and by we do automatically what at first required the closest attention.

Fifthly, Continuous Training. This matter of overcoming evil habits and forming right habits implies a desperate struggle, the most heroic and persistent effort. More than simply *will* is necessary: with the determined will must go the steady, uninterrupted training process. Habits that have long been practiced may have gained such strength as to set at defiance any power of the will that can be brought to bear upon them. We have for illustration the experience of the drunkard.

"There is a wrong philosophy," says Beecher, "in supposing that a habit which has fixed itself in the fleshy nature can be overcome by the mere exertion of the will. It is not enough to resolve against it. You cannot vanquish it by the power of a resolution. To that must be added continuous training." Forming right habits means *training.* The faculties, nerves, muscles of the child need to be *trained.* Education means *training—leading out*—continuous *leading out*, of the stream of mental and nervous energy over the same pathways until habits of acting right are firmly fixed, and then the stream will continue to flow on in the same channel of its own accord.

Says Archbishop Whately: "Whatever a man may inwardly think and say, you cannot fully depend upon his conduct till you know how he has been accustomed to act. For continued action is like a continued stream of water, which wears for itself a channel that it will not be easily turned from." Training is the stream that wears deep its channel from which it is not easily turned aside. Hence the wisdom of Solomon's utterance, "Train up a child in the way he should go: and when he is old, he will not depart from it." This pedagogical maxim has stood the

test for ages and it is still the summing up of the best experience and the soundest philosophy of education. Solomon did not mention in so many words anything about the "psychologic foundations of education,"* but that is precisely what he was thinking about, for the *law of habit* is the psychologic foundation on which his maxim rests. As long as mind is mind and nature is nature, so long will this maxim point the true theory of education.

Join this utterance of the wise man with that of another very wise man who looked deep into the nature of the soul and who founded his theory of soul-culture upon ultimate facts of experience, and you have a complete view of the best educational system the world has ever known—"I see another law in my members warring against the law of my mind . . . The good that I would I do not; but the evil that I would not, that I do . . . To will is present with me, but how to perform that which is good I know not" (Rom. 7: 15—21). Here is brought out the nature and present condition of the soul, and its consequent predisposition to evil habits; hence the *necessity* of just such a method of soul-culture as Solomon suggests, the key-word of which is "train up."

QUESTIONS.

1. Define habit.
2. Psychological idea of habit.
3. Explain "pathway of discharge."
4. On what property of nerve-substance does this depend? Explain.

*Harris, "Psychologic Foundations of Education,"

5. What is said of molecular disposition?
6. Give substance of Prof. Wundt's remark.
7. What is meant by nerve-disposition?
8. What is meant by "habitude"?
9. Point out its practical value to the music student.
10. How is *skill* possible?
11. Illustrate the principle by facts from physical nature.
12. Explain ground for the *personality* of musical instruments.
13. Give Rousseau's remark about education.
14. What further is said on the same subject?
15. Explain "Habit is ten times nature."
16. What reference to Rip Van Winkle?
17. *First* reason why evil habits should be avoided?
18. What is said of native reactive tendencies?
19. What is said of the *Kindergarten* and *manual training* methods?
20. *Second* reason for avoiding bad habits?
21. How is habit the "flywheel of society"?
22. Why is it hard to correct evil habits?
23. Give example of the Grecian flute-teacher, and what may we learn from it?
24. Show importance of "the first time" in doing things.
25. Wherein is the first music lesson a crisis in the pupil's life?
26. Importance of attending to little mistakes?
27. State Prof. Bain's two educational principles.
28. Quote testimony of the music pupil.
29. What is said about *instruction* and *education* in music?
30. What is said about the teacher's *manner?*
31. Incident about Liszt and Beethoven, and what does it illustrate?
32. Value of *love* in the teacher's art?
33. *First* suggestion for forming right habits?
34. State *second* suggestion.
35. Quote remarks about concentration.
36. How many hours should one practice? Explain the principle.
37. Bodily conditions necessary to a strong nerve-current?
38. Method for curing stage-fright, and on what does it rest?
39. What is said of undivided *attention?*
40. What is said about hard work? Quote sayings of several authors.

41. What need of *will-power?*
42. Quote Arnold and Buxton on the value of energy.
43. Give *third* suggestion for forming right habits.
44. Explain psychological ground of the rule.
45. Show need of thought to guide the hands.
46. Need of thought in the common practice exercises?
47. Consequences of thoughtlessness?
48. What about the false and the right conception of artists?
49. What about methods of teaching and learning music?
50. Should a pupil first take his new piece to the piano to try it over? Why?
51. Why bring broad intelligence into the music work?
52. How shall this be done?
53. Show need of high intelligence for interpreting musical conceptions.
54. What is said of *classic* music?
55. How may the music pupil enlarge his field of ideas?
56. *Fourth* suggestion for forming right habits?
57. On what principle does this rule rest?
58. State *fifth* suggestion.
59. Why is *training* so important in education?

CHAPTER VII.

Association.

THE workings of thought often seem mysterious. Ideas come into our minds apparently without cause and without connection. For days and weeks perhaps I have been trying to recall some name, but all in vain. One day as I am walking along the street, my thought wandering miles and miles away from the object in quest, all at once the forgotten name comes into my mind as indifferently as if I had never tried to recall it, suggested, it may be, by the fruit-vender's call, or the teamster's commands to his horses, or some article in the show-window. I know not how the name has come back into my consciousness, what has happened among the brain-cells, or what has disengaged the name-concept from other concepts below the threshold among which it was entangled—I know simply that the name has come back to me under such and such circumstances. The mind works under strange conditions, indeed, and to the psychologist these strange operations are as interesting as they are strange. Who can count, or account for, the silly fancies, the grotesque suppositions, the irrelevant reflections, the strange thoughts, etc., that come and go in the stream of consciousness during the course of a single day? They seem to be entirely disconnected; apparently there is no causal bond between them; but the fact is

that they are not causeless effects; there is a link of connection between them all.

Sequence of Ideas. In the chapter on concept-mass we learned that no concepts stand alone. Every idea that is in the mind or ever comes into consciousness is connected with other ideas. So in the stream of concepts that make up consciousness at any moment, there is a logical sequence, a definite order, in which the concepts come and go. This order is determined by *association*. However disconnected and fantastic the ideas which float through our minds may be, they come and go by virtue of a law as definite as that which controls the flow and ebb of the tides, regulates the seasons or holds the planets in their courses—it is the Law of Association.

Mr. Halleck tells us that he was once surprised, in a distant city, to find a picture of the Yale campus appear in his mind. He was thinking of a subject which had no conceivable connection with that campus. The mystery was solved when he realized that he was at that moment hearing a certain tune whistled, which had before been strongly associated with the college grounds.*

Notice in the following example how one idea is associated successively with another, and therefore how one brings up another. I sit in my study—I hear a loud rumbling noise in the street below—it is occasioned by some heavy vehicle—it is a traction engine previously seen—a picture of an accident I witnessed years ago comes into mind—there is another engine coming round a sharp corner—a horse, frightened by the sight and sound, makes a sideward spring and overturns the carriage—picture of a man

*Halleck, "Psychology and Psychic Culture."

who jostled me as the crowd was running towards the scene of the mishap—he looked like Jones—have not seen Jones since I was at school—the first time I saw him there he was sitting on the library table, eating sandwiches—I always said there was no use in letting those books remain in cloth binding—that reminds me, I would better have my magazine sets bound before they cost too much—I don't like to spare those articles of Brown's—I shall want them for that essay on finger training—by the way, that clavier has just arrived—the express man Tom brought it—Tom has a stiff hand, the result of a railroad accident—the train was ditched by a cow belonging to my friend Wilson—he is now at Leipzig—the old "Gewandhaus" has been demolished—those celebrated concerts, conducted by Mendelssohn—a plain marble cross in Old Trinity Churchyard, Berlin, marks his final resting place, etc. etc. Seemingly there is no connection between these various ideas, and no definite order in which they come, but the law of association explains why the ideas succeed one another in just this order and no other. No idea ever appears unless there is a definite reason for it.

In the case of dreams our ideas are apt to be wild and fantastic, but the current flows on obedient to the same laws as those that control our waking thoughts. The ideas that make up the dream come in their particular order according to the law of association. If a person gets the cover off his feet on a cold night, he may dream of walking barefoot on a glacier; or if he has recently been reading about Nansen's polar expedition or about Klondyke adventures, he will probably dream of strange experiences in those inclement regions.

Physiological Basis of Association. I think a careful study of the facts of experience will leave little room for doubt that the phenomena of association rest on a physiological basis. This appears the more probable when we reflect on the process of perceiving outward objects. How, for instance, do I obtain the percept and the concept of an apple? With the eye I gain facts concerning its size, shape, color; with the fingers I learn that it is rough or smooth, hard or soft, also that it is large or small, round, flat, oblong, etc.; with the sense of taste I find out that it is sour or sweet, or has any specific flavor; with the sense of smell I become aware of its characteristic apple-odor, and so on. From these various sense-data, how do I form the concept of the apple? The object that has awakened these different sensations of color, shape, size, taste, smell, etc., is not to me an *apple* until they have all been woven together into one mental picture which I call the concept of the apple. The psychological laboratory reveals the fact that the several senses report their respective items of information to different subordinate centres in the brain; the eye reports to one part, the ear to another, the taste to a third, and so on; different groups of cells have been in action and have received corresponding contents or impressions, like so many separate lakelets into which flow streams from different sources. How is it possible for these different sensations to be brought together into one idea, the concept of the apple? By *association of sensations*, effected by means of cells and groups of cells that communicate one with another by connective fibres of the brain. Here we find the physiological basis of the association of ideas. Though this can be accepted only as

a theory it nevertheless affords a plausible explanation of the phenomena in the case.

Laws of Association. Several distinct laws of association have been observed, according to which ideas naturally group themselves and which determine the order of their reproduction. These laws have been differently stated and classified. In general they have been classified as primary and secondary. By a *primary law* of association is meant a general, universal rule which all ideas obey in coming into consciousness; by a *secondary law* we mean some particular reason why one of many associated ideas recurs to consciousness rather than the rest.

Primary Laws of Association. There is really only one sharply defined primary law of association, and that is the *law of contiguity*. Contiguity means the state of being contiguous, that is, in actual contact, touching, adjoining, neighboring, adjacent. Contiguous ideas are those which are adjacent in the same group, those which came originally into consciousness at the same time or at different times under like circumstances, as parts of the same mental picture and apperceived in the same state of concept-mass. Ideas grouped together in this way have a tendency to recall or suggest each other, so that when one for any reason is called up the rest of the group will likewise come, just as when I take hold of one link of a chain and raise it up, other links will also rise.

In applying and explaining the law of contiguity it is not necessary that objects must be actually contiguous in space and time. The objects thus associated may be thousands of miles apart and may be separated by a stretch of many years; it is necessary only that the mind perceives the ideas together, side by

side in the same group. If, for example, when reading history, I have at any time grouped in my thought the names of Hannibal, Alexander, Caesar, Napoleon Bonaparte, Wellington, Washington, Grant, etc., as those of the world's great generals; or Beethoven, Mozart, Mendelssohn, Händel, Bach, Schumann, Chopin, etc., as musicians; or Shakespeare, Milton, Dryden, Pope, Shelley, Burns, Tennyson, Longfellow, etc., as distinguished poets—whenever afterwards any one of these names comes into mind the other associated names will follow, though the persons they represent lived in distant portions of the earth and at widely separated periods of time. The principle of contiguity is just as applicable as if all the persons named were present in one place and at one and the same time. It is enough that their names have been brought together in the same mental group and there stand side by side.

Contiguity includes facts both of coexistence and of succession. When ideas are in the mind at the same time, e. g., some particular house and its immediate surroundings, a person and the sound of his voice, a musical chord and a particular piano forte, the ruins of a castle and the clambering ivy, the harbor of Naples and a glowing sunset, the amorous bower and the moonlight serenade, the snow and the sleighing party, etc., they are said to coexist. When ideas follow each other, like the members of a series, the chapters of a book, the letters of the alphabet, the words of a sentence, the lines and stanzas of a poem, the seasons of the year, the days of the week, the events of a life time, etc., they are ideas in succession.

In learning the alphabet, *a* is associated with *b*, *b*

with *c*, *c* with *d*, etc. Therefore, in repeating the letters we say, *a*, *b*, *c*, *d*, and not *a*, *m*, *h*, *x*, because this is the order in which the concepts of the letters on first coming into the mind were successively associated.

Suppose I undertake to memorize Gray's Elegy in a Country Churchyard.—"The curfew tolls the knell of parting day"—In memorizing the lines I learn the successive words in just this order and no other, that is, the concepts are associated in my mind in this particular way; hence, in reproducing the lines I start with the first word and then the following words come in the order of their association. Were it not for this law, other words foreign to the poem might come in at any point; the mind might turn aside and think of parts of other poems, and so instead of following the lines word for word in the right order it would make a conglomeration of various disconnected words and phrases. Thus, "The curfew tolls," "My country, 'tis of thee," "Once upon a midnight dreary," "Strike, till the last armed foe," "All blessings flow," etc.

That the phenomena of contiguity have a cerebral explanation is very probable. Whenever any brain cells have once acted together in any process of perception, the subsequent stimulation of any one in the given group will tend to set the others into a motion similar to that which they had previously experienced. "When two elementary brain-processes have been active together or in immediate succession, one of them, on re-occurring, tends to propagate its excitement into the other" (James).

Secondary Laws of Association. According to the general or primary law just now stated, *all* associ-

ated ideas should be reproduced when any one of the series is made to return to consciousness. If brain cells, sensations, and concepts are associated as has been explained, we might suppose that our whole past experience would be constantly streaming in endless succession through our consciousness, since at any moment some brain processes are sure to act in conjunction with others that have acted before in a similar way. But as a matter of fact we know that such is not the case. To answer this question we must unfold our subject farther, and bring under consideration certain specific principles which are called the secondary laws of association. Here we inquire why some particular concept among many associated concepts on a given occasion comes into consciousness in preference to others, and why not all in regular succession return.

The solution of the problem depends on a principle of nervous activity, called the *summation of stimuli.* This means that a stimulus which by itself would be insufficient to excite a nerve-centre to effective discharge, may, by acting with one or more other stimuli equally insufficient by themselves, bring about such discharge. The balking car-horse may serve to illustrate the principle. No single thing is able to start the horse; but by applying a number of exciting causes his balking may be overcome. For example, the driver uses his voice and the reins, a bystander pulls at the bridle straps, another applies the whip, the conductor rings the car-bell, the passengers get behind the car and shove it upon the horse's heels, a boy precedes with some tempting ears of corn or bunch of grass, the lady passengers try to scare the horse with their parasols, etc., etc., when

all of these incitements are applied at the same time the obstinacy of the animal generally yields, and he goes on his way rejoicing. So when we are trying to recall a lost name, we think of as many "cues" as possible,—we repeat the letters of the alphabet, then we form syllables with the letters in alphabetical order, we think of other names, akin to the one in quest, and so on,—and the method generally succeeds on the principle of summation of stimuli; discharges from associated brain cells reenforce each other, and by their joint effect determine whether one idea or another shall be awakened.

The father of a dull boy, wishing to exhibit to some guests the boy's progress in kindergarten instruction, holds his penknife upright on the table, and says, "What do you call that, my boy?" "A knife," is the persistent answer. Recollecting that in the kindergarten exercises, not a *knife*, but a *pencil*, was used, the father held upright his pencil and repeated his question, whereupon the desired answer promptly came, "I call that *vertical!*" The example strikingly illustrates the working of the boy's mind. He had often seen a *knife*, but not in connection with the idea of a vertical line, and therefore the sight of the knife alone did not awaken the concept *vertical*; when, however, the *pencil* was substituted, which before had acted with other things in producing a particular group of impressions, immediately it served to bring up its associated concept of a vertical line.

In the phenomena of association we have both *total recall* and *partial recall*. According to the law of contiguity, our ideas should return to the mind with unvarying regularity, just as the notes in the tune of the organ-grinder. But our minds do not

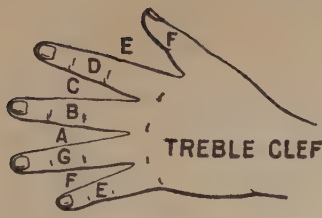
work in such a mechanical way, our ideas do not always come and go just like the notes of the music box. In partial recall some constituent concepts of the original group are passed over, while others reappear; not all our past experiences are equally operative in determining what particular ideas shall appear in the awakening series. Not all are equally prominent: there is always some one that stands out above the rest and, so to speak, dominates the reproductive process. That item is always the one that appeals most powerfully to our interest. The following illustration, adapted from Prof. James, shows this principle of interest. Looking at my clock (1879), I found myself thinking of Mr. Bayard's resolution in the Senate about our legal tender notes; the clock called up an image of the man who repaired its gong —he suggested the jeweler's shop where I last saw him—the shop recalled some shirt-studs which I bought there—the studs, the value of the gold and its recent decline—the gold, the equal value of greenbacks—these brought up the question of how long they were to last—and so, finally, the Senate Bill. Each of these images in the associated series, offered various points of *interest.* The *gong* at the moment referred to was the most interesting part of the clock, because, having begun with a beautiful tone, it had become discordant and aroused a sense of disappointment (hence, the need of the repairer's services). This explains why I thought of the *gong* and then of the succeeding members of the series, rather than of the friend who presented the clock to me, or one of the many other circumstances connected with it. So then to explain the phenomenon of preference in the

matter of partial recall we must resort to the principle of interest, to which we shall refer again.

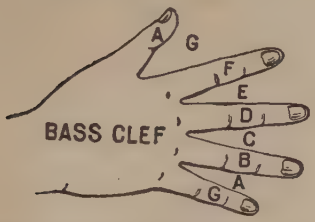
Several forms of the secondary laws of association are to be noted.

1. ***The Law of Correlation.*** Otherwise stated, this means *likeness.* If there are fifteen ideas associated by contiguity, and if there is *likeness* between the third and seventh, these will be most apt, other things equal, to come into the mind together. Where there is any thought-relation between ideas, they are apt to suggest one another. The study of etymology affords many examples of such thought-relation, the great majority of words being founded on physical imagery insomuch that one has called our dictionary a 'collection of faded metaphors.' Our word *tribulation* (from *tribulum*, a threshing instrument) suggests *wheat* or *chaff*, and *vice versa; chastisement* (from *castus*, white), a process of cleaning, further associated with *snow* and *wool* ("Though your sins be as scarlet, they shall be as white as snow; though they be red like crimson, they shall be as wool"); *succor* (from *sub* and *curro*, to run under), the idea of one person putting his shoulder under the burden which another is bearing; *imbecile*, the image of a tottering form resting on a staff, etc. The study of etymology carried on in this way, namely, by correlating images and meanings, not only makes the subject intensely interesting, but also cultivates the habit of associating concepts according to their inner thought-relations.

It will help one to remember the position of the several letters on the staff by associating the staff with the human hand, thus:



LINES { A-lways
F-inely
D-o
B-oys
G-ood



SPACES { G-ained
E-asy
C-ases
A-ll

The letters in the *spaces* from the bottom upwards spell F A C E.

The student should train himself to unite concepts in his mind by the natural relations of things. One of the great beauties of a trained mind is that its concept-mass is made up of rationally correlated ideas and consequently it recalls things preferably in their thought-relations, and is not enslaved by the accidents of time and place. Prof. Halleck calls attention to the fact that an ignorant person on the witness stand will insist on telling everything, just as it passed through his experience, no matter whether it bears on the case or not. His mind is a slave to the facts of contiguity, and so machine-like he repeats everything, ofttimes very much to his attorney's discomfort. If, between two given events, something else with no bearing on the case happened, he must narrate the incidental facts also in order to keep on the track of his story. For example, his associated series of concepts might run thus: Bought a barrel of

flour on trust at a red grocery—one of his children was teething—he stepped across the street to the drug store to get a bottle of paregoric—the clerk was a young fellow with a black moustache—he resembled that farmer boy, who bought the gray nag at the public sale, where he met cousin John—by the way his children have the whooping cough, and he called Dr. R.—he passed in front of his office on the way to the red grocery, etc. Having never trained his mind to think logically, i. e., according to the necessary thought-relations of things, he must relate all the events of the series in the order in which they occurred, for he has no other way of getting from the one important event to the other. If you break the chain for him, as in the act of cross-questioning, you are likely to confuse him and render him helpless so that he cannot proceed at all. He stands puzzled, like a man in the middle of a stream where an accustomed stepping stone has been removed.

The following example from Mrs. Radcliffe's "The Romance of the Forest" (quoted by Halleck), illustrates the point admirably. Peter, one of the characters, rushes into the room, with important news, which his master is eager to hear:—

"O, sir. I've heard something that has astonished me, as well it may," cried Peter, "and so it will you, when you come to know it. As I was standing in the blacksmith's shop, while the smith was driving a nail into the horse's shoe; by the by, the horse lost it in an odd way. I'll tell you, sir, how it was."

"Nay, prithee, leave it till another time, and go on with your story."

"Why, then, sir, as I was standing in the blacksmith's shop, comes in a man with a pipe in his mouth, and a large pouch of tobacco in his hand."

"Well—what has the pipe to do with the story?"

"Nay, sir, you put me out; I can't go on, unless you let me tell it in my own way. As I was saying—with a pipe, etc."

Practical life furnishes many similar illustrations. If a student has memorized a piece of music mechanically, i. e., without giving any thought to the notes, phrases and periods, he is likely to be entirely thrown off, if, in the public rendition, he accidentally omits a single note. So, in reciting a declamation, which has been mechanically committed to heart, as the phrase goes. Such methods of memorizing should be discouraged.

We should associate things logically, that is, according to their inner thought-relations, and not simply *mechanically*, or, still worse, *accidentally*. If a child for the first time sees a horse and a sheep together, the relation being purely accidental, the next time he sees one of these animals, he is apt to think of the other, not because there is any inner connection between them, but because he happened to see them together the first time. Such a process has little disciplinary value and does not contribute much to the child's growth in intelligence. The scientific educator knowing this principle will guard his pupils against accidental associations in the exercises of the school room. All their concept-associations should be based on the inner and true relation of things. Failing in this, the business of instruction becomes more difficult, and the results less satisfactory. We all know how hard it is to memorize and recite, for example, the Proverbs of Solomon, or the maxims of Poor Richard's Almanac: the reason is that the reciter sees no connection between the successive verses or maxims, and so must depend upon pure memory. Not only is the process of memorizing made much easier

but it also contributes much more to mental growth if the things learned are connected by a true thought-relation.

Among the inner relations of things, may be mentioned those of cause and effect, instrument and use, means and end, law and example, container and thing contained, symbol and thing symbolized, genus and species, etc. Further examples of correlates are such as, the wing of a bird and the atmosphere, the fin of a fish and the water, oar and boat, organ and bellows, piano keys and the fingers on the hand of the player, heart and blood, lungs and air, eyes and light, ears and sound, house and occupant, book and reader, the ebb and flow of tides, root and trunk, bird and nest, trough and crest of waves, the harp and the harper, lock and key, life and organization, body and soul, etc. In all these cases the relation between the parts is not accidental, but it is a relation of thought, design, adaptation.

The human mind is naturally *curious;* it delights in tracing the connections of things; the search for causes is native to it; the discovery of thought relations is an exercise entirely congenial to the inquiring mind. Gaining knowledge in the nature of the case should not be a tedious and painful process, and we can say it never is if carried on in the right way. Gaining knowledge is interesting and stimulating when we can discover the *causes* of the things we see and hear. Hence the fascination of scientific studies, such as botany, zoology, physiology, geology, physics, astronomy, etc. Learning *bare facts* in a mechanical way is apt to be laborious and uninteresting, and the facts when learned are retained with difficulty. A better way to learn facts is to learn them in connection with

their causes or the search for their causes. In the study of harmony, it will aid the pupil in learning the facts about chords if his attention is directed to the cause why certain notes make *consonance* and others make *dissonance*. That there is a cause for these phenomena the intelligent teacher very well knows, and if he can succeed in starting his pupil upon a course of investigation he will not only make the subject of harmony interesting, but he will greatly benefit the pupil in the way of mental development. It will help us to interpret a piece of classic music if we can find out why in one part there are written *major* chords and in another *minor;* why in one place, *crescendo* and in another *decrescendo; allegro* now and *andante* then; *forte* here and *pianissimo* there. It is not enough to learn, by stuffing the memory, that such and such marks are found in particular places, but it is more interesting and more important to know *why* these marks are there and why they stand in one place rather than in another.

Can the pupil know these things, and is it lawful for him to inquire into such matters? Time was when such inquiries would have been considered entirely unnecessary, perhaps, impertinent; but we are living in an age of investigation, which is true of music as well as of everything else. To carry a load of facts by mechanical association is like carrying supplies of food "in a bundle strapped upon the back;" while carrying the same facts by rational association is like carrying the food "eaten, digested, and wrought over into the bones and muscles and nerves which hold the body firm and solid and ready for use." Learning the *causes* of things awakens in the pupil a *sense of*

power and of satisfaction, a realization that he is *doing* something and is making real progress in his music studies. The feeling has a reactive influence, for the greater the feeling of power and the keener the sense of pleasure it yields, the greater is the amount of attention the pupil gives to his work. Is it possible to make the practicing of etudes interesting in the way above suggested? Let the wide-awake teacher try the experiment and find out for himself.

For these three reasons, then, we should strive to associate things according to their inner thought-relations, viz., first, because of the pleasure the mind derives from the exercise; secondly, because of the practical results; thirdly, because thereby a useful habit is cultivated.

Hence, the importance of being careful, pains-taking, wide-awake students; of setting facts into the mind in their rational order; of having intelligent ideas as to *why* things, which we find in our music lessons, are as they are, and not simply *that* they are thus and so. Do not allow either yourself or your teachers to cram your *mind* full of disconnected facts, but train yourselves into the habit of searching for an intelligent cause of the things you learn; bring new concepts into your growing concept-mass in their right relations so that every step in the process of your technical musical training may be a step at the same time in the development of your intellectual powers. We should be able, not only religiously but also musically to "give a reason for the hope that is in us"—the hope of success in our calling. It is a hopeful sign when students ask intelligent questions —not idle quibbles for the sake of killing time or for

amusement, but earnest, searching questions that help them forward and enlarge their field of ideas.

Plato defined man as a "truth-hunter". That is a good definition of a student: he must be a truth-hunter. What does this imply? The saying of Plato rests on the figure of game-hunting. Here are tracks on the snow, on the sand, in the mud—what made them? Whither do they lead? Whence do they come, etc? So in the pursuit of knowledge; the truth-hunter finds tracks, evidences, intimations, markings of all sorts—what are they? why? whence? for what purpose? why thus and here? why not otherwise, etc? It is a good practice to surround the subject of investigation with a thousand questions. One question answered is a thousand new ones raised, and thus the way into the secrets of things is opened. Socrates was a great questioner; it was thus he confounded and overcame his enemies. Our Saviour at the age of twelve was found in the temple in the midst of the doctors of the law both answering and asking questions. *There* is a picture of the model student. Music students also need to study, to inquire, to apply themselves, to be zealous truth-hunters. Study many things; not merely notes. The more general knowledge you possess, the more power you will have in the pursuit of your special calling; the more meaning you will see in the composition you are playing, the more beauty and meaning you will be able to bring out of it; the higher will be your rank as a musician.

2. ***The Law of Repetition.*** This rests on the same fundamental fact as the law of habit. If two or more ideas are often repeated in conjunction the repetition will make a firm bond of association, and the more frequent the repetition the stronger will be the result-

ing bond, and the more certain is the awakening of the rest of the series upon recurrence of any one member. "The closest associations, such as those between vocal actions and the resulting sound, words and the things named, the movements of expression and the feelings expressed, are the result of innumerable conjunctions (repetitions of acts) extending throughout life."*

The more frequently we have seen a play, or heard an oratorio, or read a poem, or written out a certain sentence, the easier will it become for the mind afterwards to run over the series of associated things. The effect of the repetition is to produce a powerful *tendency* for the mind to pass from one thing to the next in a series of associated impressions or concepts. In this way is produced also the power of *anticipation*. If B has frequently followed A, and C, B, and so on to the end of the series, the recurrence of B is sure not only to be immediately followed by C, but will also cause the mind to *anticipate* succeeding members of the series, as M, N, etc., so that the mind is able to look onward to what is coming as well as to attend to what is passing. When a pupil is learning a new tune he fixes in his mind, one by one, the successive notes as he hears the tune sung or played, or performs the act himself. By often going over the same thing, the mind, on recurrence of the first notes, moves on easily to the following ones, and even forecasts what ones are to come after. Suppose we are listening to an opera. Here are several concurrent series of ideas,—the orchestral accompaniment, the singing of the text by the *prima donna*, the actions of the supporting players, the shifting stage scenery,

* Sully, "Outlines of Psychology."

etc. The more frequently we have witnessed the same performance, the more readily will the recurrence of any one part, e. g., a particular strain of the orchestral accompaniment, recall other associated parts, e. g., a particular turn in the text, a brilliant stage display, or a striking pose by some actor. The effect of it all is to bind together the several elements into one complete whole.

3. ***The Law of Interest.*** This means that a stronger bond of association is formed between things that appeal powerfully to our feelings than those that are indifferent. Those things which interest us most are the ones most firmly linked together by association and the ones most apt to return to consciousness. The principle of interest depends on several circumstances. Among these may be mentioned that of *recency*. In most cases we are more interested in what has recently happened than in events which belong to the distant past. To be sure, recency alone does not determine the matter of greatest interest and firmest association. *Vividness* is also a powerful factor. What is exceedingly vivid necessarily makes a deeper impression and interests us more than what is ordinary. Halleck mentions the example of a person who had just left the shelter of a tree, when the tree was torn into pieces by lightning. Afterwards whenever it began to thunder an image of that tree came before him. Though there had been thousands of other objects associated in his experience with thunderstorms, he always would think of that particular experience because of its great vividness. The sighing of the wind among the pine needles always calls up to the author's mind his first view of Yosemite Valley from "Inspiration Point," because that sound

was vividly associated with the awful panorama unfolded to view from that particular spot. A heavy nimbus cloud always brings into my mind "Punch Bowl," an extinct volcanic crater in the rear of Honolulu, because while sitting on the rim of the crater one day, such a cloud having disengaged itself from the great cloud-mass in the rear and having unobservedly drifted around and in front, by and by poured itself out in a copious rain shower between the observer and the city down below. It was such a surprise, such a novel occurrence in my experience, and the whole scene was so vividly impressed that the place mentioned and that particular form of cloud are permanently associated in my thought. The chirping of the cricket in autumn time brings to mind a certain open grave in an out-of-the-way, desolate, neglected burying ground in the corner of a field. That was the first grave I had seen. My childish fancy was highly wrought upon. Seeing the grave under such circumstances and hearing, in the stillness and loneliness of the place, the solemn, measured chirp of the cricket, the scene was most vividly impressed on my mind and the two things to this day are inseparably associated. So everyone can recall similar examples in his own experience, just as striking and perhaps more interesting than any that have been mentioned. "The experiences of childhood often throng the memory of old age, because they were so vivid—they deeply affected the plastic brain cells and left there an unfailing impress."

When Joseph Haydn, a boy eight years old, was studying at the Hainburg school, George Reutter Capellmeister of the Cathedral of St. Stephen's in Vienna, passed that way in search of boys' voices for

his choir. He examined young Joseph. Placing a canon before the boy, he asked him to sing it at sight and Haydn obeyed with so much readiness and correctness of ear and tone that Reutter was delighted. While Haydn was singing Reutter observed that the boy cast longing glances at a plate of cherries on the table, and throwing a handful into his cap he said, "Well done, you little rascal!" Haydn used to say afterwards that he never saw a plate of cherries without thinking of that day and occasion, which proved so important in his career.

We see how strong a factor personal interest is in determining the current of association. When we understand this principle thoroughly, we can easily explain many strange experiences in our lives. Those ideas are most likely to return to consciousness on a given occasion which have previously appealed most powerfully to our feelings; hence, if any one of the series of impressions is reawakened the other associated members are sure to reappear.

The facts of heredity may be selected farther to illustrate our subject. What *heredity* does in our mental life is quite similar to the facts of association explained on the basis of nervous and mental predisposition. The same laws seem to govern both classes of phenomena; we may infer, therefore, that their causes are similar, if not identical. For example, "to the son of a drunkard, a glass tumbler or bottle is likely to suggest saloons, liquors, drinking carousals, etc. The son who has inherited a preference for art will think or dream most often of objects connected with art. The daughter of a musician is likely to have the greatest facility in recalling ideas connected with music."

Heredity is not everything, as Mr. Galton in his book on the subject claims, but it is a great factor in determining mental bias or the current of association. Bach's father and brothers were musicians and his ancestors for generations back were of a musical turn of mind. Mozart's father was a professor of music. Weber's father was a man of musical taste and of some skill in the same direction. No little part of Mendelssohn's peculiar bent and all the merit of his earlier musical training must be accredited to his highly cultured mother. Raphael's father was a painter of considerable reputation in his day. John Wesley's ancestors for four generations had been scholarly churchmen. Van Dyck, the master of portrait painters, was particularly fortunate in his parentage, his father having been a painter on glass and his mother a painter of landscapes, from whom also he received his earliest art instructions. James Watt's love for tools and his mechanical dexterity may be traced to his father. The father of Palissy, the noted Huguenot potter, was a tile-maker and a worker in clay. Edmund Burke's father was an attorney of prominence in Dublin. And so we could multiply examples indefinitely, all of which are highly suggestive in the line of our remarks on heredity and association. We say heredity *and* association, because if the facts in both cases could be traced back to their primary cause, perhaps we should find that they rest on the same basis. If we were to go outside of human psychology and enter that exceedingly fascinating field of animal psychology, just now attracting so much attention, we should find many very strong confirmations of this view.

A change in our emotional states may change the

direction of our associations. The following example, suggested by Halleck, will serve to illustrate. An idea, A, is often followed by an idea, S, one day and by L the next day. I pass a certain farm on Monday, and I think of a pear tree in the orchard, while on Tuesday, passing the same farm, I think of the well behind the house. Why this change in the direction of association? On Monday, when I passed the farm I was *hungry*, and therefore, the picture of the tempting fruit, which I had previously plucked from that particular tree, came into my mind. On Tuesday, I was *thirsty*, and therefore, the well, from whose cool depths I had previously slaked my thirst, was the first to come into my thought. If we carefully note all the circumstances connected with the flow of our ideas we shall have little difficulty in explaining the peculiar facts of association.

4. ***The Law of Voluntary Attention.*** *Attention* may also be mentioned as one of the secondary laws of association. If the attention has been strongly fixed by an act of will on some particular ideas in a series, these ideas are thereby strengthened and will have the precedence in the reproduction of the series. The greater the mental effort we put forth in centering the attention on some particular thing, the greater is the probability, other things equal, that the concept of that thing will return to consciousness in preference to others. If we read the poetry of Shakespeare, Milton, or Tennyson in a listless way, that is, without giving much mental energy to the exercise, but few ideas from these authors will find a permanent place in our concept-mass, and they will have little power to direct the stream of association in our literary life. If we play the compositions of Bach

and Haydn with feeble attention, they will have little influence to enrich our music life with inspiring suggestions.

The Educational Bearing of Association.

The facts and laws of Association have important applications to education. For example, the principle of interest may be used to good advantage in dealing with the various subjects of instruction. Some things appeal immediately to the pupil's interest, while in the case of others, interest may be aroused by associating them with things which are interesting in themselves. There is a simple law which controls the association of natural and acquired interests; if the teacher understands this law he can make use of it in causing the pupil to become interested in subjects which in themselves are not interesting to him. Any object not interesting in itself may become so by associating it with some other object in which an interest already exists. The two associated objects grow, as it were, together; the interesting portion sheds its quality over the whole, and thus things not interesting in themselves acquire an interest which becomes as real and as strong as that of any natively interesting thing.

There is nothing that has so great interest in itself to a man as his own personal self and its fortunes. Hence, the moment a thing becomes connected with the fortunes of one's self it becomes an interesting thing to that person, however indifferent it may have been before. This is a pedagogical principle of great value. What should the teacher do with a pupil who has no interest in a given subject which he is trying

to teach the pupil? Our principle suggests that he should begin with things in the line of the pupil's native interest, and then gradually bring to his attention other things that have some immediate connection with the former. Then, step by step, he should connect with these first objects and experiences the later objects and ideas which he wishes to instil in the pupil's mind. By associating the new with the old, the natively interesting with the uninteresting, he will be able by a little skill to surround the entire system of things and of mental experiences with an atmosphere of lively interest.

Then, too, there is suggested immediately the importance of the atmosphere into which the life of the child is cast and in which the educating process goes on. The environment of the home and of the school-room claims the earnest attention of the educational philanthropist.

In the home and in the school-room are formed the associations which in after life are to give direction to the stream of ideas; here is formed the *web* of character into which the incidents of life as *woof* are to be woven. Plainly enough the guardians of our homes and of our free schools have no moral right to neglect the aesthetic condition of the place whence starts the stream of life. It should be made attractive both inside and outside. The most beautiful spot should be selected, and then no expense or pains should be spared in its suitable adornment. The city school house should not be crowded in among other buildings, but it should occupy a sufficiently large open place, beautified with lawn and shrubbery and flowers tastefully arranged. These things are silent but powerful factors in the education of childhood,

and are quite as important as books, charts, etc. If the stream of association starts out from beautiful, chaste, and elevating objects and surroundings, there is less danger that it will turn aside afterwards into filthy places. If an inspiring environment is important to the birth and early life of a poet, it has similar value in the education of every soul.

"If children are daily surrounded by those influences that elevate them, that make them clean and well ordered, that make them love flowers and pictures, and proper decorations, they at last reach that degree of culture where nothing else will please them. When they grow up and have homes of their own, they must have them clean, neat, bright with pictures, and fringed with shade trees and flowers, for they have been brought up to be happy in no other environment."*

The mere looks of a schoolhouse and the surrounding playground have a wonderful influence on the mind of the average child. Our railroad corporations build beautiful station houses and set them in beautiful garden plots, radiant with flowers and trees. The rural schoolhouse, generally speaking, is depressing and degrading in its character and influence. There is nothing about it calculated to encourage or cultivate a taste for the beautiful in nature or in art. Yet this is the place and such the surroundings where the stream of national life takes its start; as the fountain, so will be the stream.**

Much is said in our day about the sanitary condition of school buildings, and certainly the subject

*Bulletin No. 160, Jan., 1899, Cornell University.

**Compare Article "The Schoolhouse Beautiful" in the Perry Magazine, Jan., 1900.

deserves all the attention it is receiving and more, too; but it is quite as important to look after those conditions that will secure the aesthetic, moral, and spiritual health of the children during the period of training. It makes much difference what kinds of pictures are hung upon the walls of our homes and school rooms, or adorn the pages of our school books; what kinds of ornaments we select for the jewelry we wear upon our persons.

No one who understands the mighty influence of these art-forms in the way of shaping taste and directing the stream of association can doubt for one moment their value as educational forces. Fill the mind of childhood and youth with beautiful pictures, chaste figures, elevating images, and you gain in these an initial power of association which will do much in carrying forward the development of character in a safe channel and making the experiences of subsequent life rich and interesting. One has said, "Let me write the songs of a nation, and I care not who makes the laws." With equal propriety and truth we may say, Let me paint the pictures of a nation, and the laws will make themselves. So the power of literature consists not any more in the *facts* it conveys than in the *pictures* of association it brings into the mind. The power of a good book, apart from the valuable information it imparts, in the way of filling the mind with pure images as bonds of association with holy things and things helpful in right thinking and right living, is greater than human arithmetic can estimate. So on the other hand, the vicious and depraving images and suggestions which a bad book brings into the mind of the reader are

among the most deadly forces in the hands of the destroyer of souls.

Therefore, home life and school life should be made interesting and helpful to youth. Youthful associations abide long years after the days of youth have fled, and they leave their stamp upon the life we live, whether we will it so or not. Early life should be linked with that which is elevating and noble; with good books, chaste pictures, pure images; with the inspiring forms of nature,—with mountains, fields, brooks, trees, flowers, stars, the waterfall, the ocean. As Phillips Brooks so beautifully has said, "You must feel the mountains above you while you work upon your little garden." Or as the poet has said,

> "To him, who in the love of nature holds
> Communion with her visible forms, she speaks
> A various language: for his gayer hours
> She has a voice of gladness, and a smile
> And eloquence of beauty; and she glides
> Into his darker musings with a mild
> And healing sympathy, that steals away
> Their sharpness ere he is aware."

Relation to Music. And what is the relation of all these things to music and musical education? Vastly more vital than we realize. It is a serious thing what kind of musical thought-associations we make. If the reading of literature is a potent influence in general education, so the study of musical compositions and of musical literature is an equally powerful factor in musical education. In both cases the same psychological principle holds.

What power is there in music? All races of men from remotest antiquity have felt the power of music, and have acknowledged the same by giving special

attention to it in their social, civil, and religious institutions. It has always been a subject of wonder, and its marvelous power has given rise to many legends and fables. Reference has already been made to some of the stories of ancient mythology. Early history abounds in similar wonders. Terpander restored a rebellious people to their allegiance through his melodies. Tyrtaeus aroused a whole army to action by the sound of his flute. The legislators of antiquity made use of music as a method and means of government. Plato said that no change can be made in music without a similar change being made in the state, and that tones can be selected capable of arousing malice, insolence, and their opposites. He emphasizes the influence of the proper music on the formation of character, and proceeds to specify the general scales in which music should be written. The high Lydian is plaintive, the Ionian and Lydian are soft and convivial, the Dorian is the music of courage, and the Phrygian of temperance. Aristotle agrees in general but considers the Phrygian music as exciting and orgiastic. The Lydian is a tone to a tone and a half higher than the Phrygian, and the Dorian is a tone below the Phrygian. The Dorian is a medium, easy pitch, neither too high nor too low, and expresses a manly character and a full flow of strength. What makes this difference of effect?

In the first place, it is true that the special melody associated with each scale has much to do with the case. There are many examples to show this. Another fact developed in the psychological laboratory comes to our aid in explaining the phenomenon under consideration. Music has a direct influence on the *will*. The force of will varies according to what

we *hear*, as well as what we *feel* and *see*. The following experiment devised by Prof. Scripture, shows this:—"With the thumb-and-finger grip (making use of the Dynamometer) the greatest pressure I can exert during silence is 4 kilos. When some one plays the giants' motive from the 'Rheingold' my grip shows 4½ kilos.* The slumber motive from the Walkürie reduces the power to 3¼ kilos." This is an exceedingly interesting and suggestive experiment, and may give us a clue to the secret about the power of music. It appears from experiments of this kind that pitch alone has much to do with the effect produced by different scales. The strength of grip varies with the pitch: tones of a moderate pitch, such as the Dorian above mentioned, increase the power of the grip, while very high or very low tones weaken it. One thing, I think, is plain, and that is that the facts of music may be explained on scientific ground and that such explanation is to be sought for in the field of psychology. That the various effects of music are due ultimately to associated brain impressions and associated thought-concepts is highly probable. We know what influence martial music has upon soldiers on the battle field. The *Marseillaise* (pronounced mär′-sā′-yāz′) helped to achieve the French Revolution. So "Ein' Feste Burg" has inspired courage in the heart of many a soldier of the Cross.

Music has power to calm base passions, and bring noble ones into play. As Pope sings in his "*Ode on St. Cecilia's Day*":

> "Music the fiercest grief can charm,
> And fate's severest rage disarm:
> Music can soften pain to ease,

*Scripture, "The New Psychology," p. 221.

And make despair and madness please:
Our joys below it can improve,
And antedate the bliss above."

Gibbon, in the last volume of his "Decline and Fall of the Roman Empire," observes that it is proved by experiment that the action of sound, while accelerating the circulation of the blood, affects the human frame more powerfully than eloquence itself. He then cites the following anecdote, contained in an account of a journey through England and Scotland.

According to the most ancient traditions, the bagpipe has always been the favorite instrument of the Scotch, since it was first introduced into the country at a very remote period, by the Norwegians. The larger one figures in their battles, funeral processions, weddings, and on other great occasions; the smaller sized one is devoted to dancing music. Certain martial airs, called *pibrochs*, produce the same effect on the natives of the Highlands as the sound of trumpets does on their chargers, and sometimes even miracles are performed almost equal to those attributed to the music of Greece.

At the battle of Quebec, in 1768, while the British troops were retreating in disorder, the commander complained to a staff officer of Fraser's regiment, of the bad behavior of his corps. "Sir," replied the latter with some warmth, "you made a great mistake in forbidding the bagpipes to be played; nothing animates the Highlanders to such a degree, at the hour of battle; even now they might be useful." "Let them be played as much as you please," answered the commander, "if that can recall the soldiers to their duty." The musicians received the order to play the favorite martial air of the Highlanders; as soon as

the latter heard the familiar tones, they paused in their flight and returned with alacrity to their post.

The influence of music on the physical organization of animals and of man is very well known and writers on the subject record many curious examples. Cabanis says: "There are peculiar combinations of sounds, and even of single tones, that affect all the faculties of sense; these, by their immediate action upon the soul, arouse certain sentiments over which they seem to have special power, in accordance with the primitive laws of organization." Grétry mentions a surprising effect of music on the heart and the circulation of the blood. "I placed three fingers of the right hand on the artery of my left arm, or on any other artery in my whole body, and sang to myself an air, the *tempo* of which was in accordance with the action of my pulse; some little time afterward, I sang with great ardor an air in a different *tempo*, when I distinctly felt my pulse quickening or slackening its action to accommodate itself by degrees to the *tempo* of the new air." Berlioz relates the effects produced on him by hearing music of which he was particularly fond, in the following graphic language: "Nothing in the world could give an exact idea of the effect, to any one who has never experienced it. My whole being seems to vibrate; at first it is a delightful pleasure, in which reason does not appear to participate at all. The emotions increasing in direct ratio with the force or grandeur of the composer's ideas, produce, little by little, a strange agitation in the circulation of the blood; my pulses beat violently; tears, which usually give evidence of the crisis of a paroxysm, indicate only a progressive stage, and greater excitement and agitation is to follow. When the

crisis is really reached, there occur spasmodic contractions of the muscles, a trembling in all the limbs, a total numbness of the feet and hands, a partial paralysis of the nerves of vision and hearing: I no longer can see, and can hardly hear—vertigo—semi-consciousness.—" The celebrated *cantatrice* Malibran, on hearing for the first time Beethoven's symphony in C minor at the Conservatory, was thrown into such convulsions that she had to be carried from the room.

The effects of music on man's moral and intellectual nature are equally great and even more marvelous. When King Saul was tormented by the evil spirit, David touched his harp, and the king was comforted and became calm again, for the evil spirit left him.

Dryden, in his famous ode, "Alexander's Feast,"* beautifully describes the power of music on the emotions of men. The proud king is a mere plaything in the hands of the skilful musician, who with his lyre sways the changing passions at his will.

"Timotheus, placed on high
Amid the tuneful quire,
With flying fingers touched the lyre:
The trembling notes ascend the sky,
And heavenly notes inspire.

* * *

With ravished ears
The monarch hears,
Assumes the god,
Affects to nod,
And seems to shake the spheres.

* * *

The praise of Bacchus then the sweet musician sung—

* * * * * *

*This poem was set to music by Händel in 1736.

Soothed with the sound, the king grew vain;
Fought all his battles o'er again;
And thrice he routed all his foes, and thrice he slew the slain.
The master saw the madness rise,
His glowing cheeks, his ardent eyes;
And while he heaven and earth defied,
Changed his hand, and checked his pride.
He chose a mournful muse,
Soft pity to infuse.

* * *

Softly sweet, in Lydian measures,
Soon he soothed his soul to pleasures.

* * *

Now strike the golden lyre again;
A louder yet, and yet a louder strain.
Break his bands of sleep asunder,
And rouse him, like a rattling peal of thunder.
Thus long ago,
Ere heaving bellows learned to blow,
While organs yet were mute,
Timotheus, to his breathing flute
and sounding lyre,
Could swell the soul to rage, or kindle soft desire."

Music was recommended by the ancients as a curative agent, and not without cause. There are numerous instances of diseases both of body and mind treated, and relieved by skilfully combined sounds. Coelius Aurelianus mentions a flutist who, by playing in the Phrygian mode, could *charm*, as it were, the diseased part, causing it to palpitate and tremble. Bonnet says he has known several persons suffering from gout who employed music as a means of relief for acute pain, with entire success. Sauvages mentions the case of a young man, who had been attacked with intermittent fever, accompanied by violent headache; he could be soothed only by the sound of a drum.

Music has a favorable influence on digestion; hence, the ground for the custom so common in high life of having music performed during feasts. Voltaire hardly realized the full meaning of his witticism to the effect that our purpose in going to the opera is to promote digestion. Listening to good music is undoubtedly the best mode of exercise that literary persons necessarily leading a sedentary life can take. Milton, the poet, philosopher, and musician, spent a certain time every day after dinner in singing or playing on some kind of instrument. Democritus informs us that the sound of the flute is a remedy against the plague. Celsus, speaking af the insane, says, "We must quiet their demoniacal laughter by reprimands and threats, and soothe their sadness by harmony, the sound of cymbals or other noisy instruments." It is said that the Phrygian mode, full of sweetness and vivacity, is admirably adapted to those who are one moment overwhelmed with grief and the next thrown into paroxysms of rage; while the martial Dorian mode suits those who are given to talking and behaving in a silly manner, and indulging in bursts of meaningless laughter.

In the records of the Academy of Sciences at Paris, the case is mentioned of an illustrious musician and composer who was attacked by a violent fever, accompanied by continuous delirium. The third day of his delirium he asked if he might hear a little concert in his room. Bernier's *cantata* was sung. As soon as he heard the first notes, his countenance became calm, his eyes assumed a quiet expression, and the convulsions ceased entirely; he shed tears of pleasure, and the fever left him while the concert lasted, but as soon as it was over he relapsed into his for-

mer condition. After ten trials of the same treatment a complete cure was effected.

Quarin relates an instance of epilepsy cured by music. "One day the patient having been listening to music when she felt the epileptic fit coming on, suffered only the symptoms. Every time afterward that she felt the approach of the paroxysm, the young girl was placed so that she could hear music; and nature, being thwarted, as it were, in its perverted tendencies, lost finally the habit of convulsive movements." A similar case is mentioned by Roger. A young lady belonging to the department of La Drôme suffered from a nervous disease resembling catalepsy. The sound of the violin relieved her in a surprising manner, and if she had the good fortune to hear it before the paroxysm was upon her, she was saved from it entirely.*

If these things are true, what do they mean? Why is music such a powerful agency? The secret lies deep down in the silent workings of the brain-cells and of the concepts in the concept-mass. The explanation is to be sought in the inner thought-relations and the associated sense-impressions awakened by the incoming sounds. If these phenomena rest on association, the question comes back with intensified emphasis, What kind of music do you hear and learn? What kind of thought associations does your musical experience make? With what are you linking your life—with the stars, or with the trailing serpent? What thoughts do the chords you hear awaken?

Surely, association is a serious thing in our life. We are fearfully and wonderfully made—bodily, mentally,

*For numerous other examples and a full treatment of the subject, see Chomet, "The Influence of Music on Health and Life."

spiritually. It becomes every one of us to ask, What manner of being am I? What *possibilities* and *probabilities* are involved in my composite nature? What is my relation to the world in which I live and what the relation of this life to that beyond the present? I am a harp of ten thousand strings—what are the sounds from without that steal in through my senses and awaken in my soul their sympathetic chords? Those sounds determine in what direction and to what goal the stream of my life shall flow. Those sounds have associated with them the ever audible and inspiring whisper of new and budding life, or else the vacancy and despair of death. How vast the importance that only sounds with hallowed associations sweep the strings of this mystic soul-harp! How solemn the chimes that peal forth the changes of human existence and human destiny!

"Oh, the clanging bells of Time!
How their changes rise and fall,
But in undertones sublime,
Sounding clearly through them all,
Is a voice that must be heard,
As our moments onward flee,
And it speaketh aye one word,—
Eternity! Eternity!"

QUESTIONS.

1. What is said of the strange workings of thought? Give example.
2. What is meant by *association*?
3. Give example of a series of associated ideas.
4. What is said of dreams? Illustrate.
5. Explain the process of perceiving an apple.
6. Explain the physiological basis of association.

7. How are the general laws of association classified?
8. State and explain the Law of Contiguity.
9. Distinguish between facts of *coexistence* and of *succession*. Illustrate.
10. Give example about memorizing Gray's Elegy, and what does it teach?
11. Give *cerebral* explanation of the facts of Contiguity.
12. What is meant by *summation of stimuli?* Give example.
13. What is meant by *total recall* and *partial recall?*
14. Give the clock example.
15. Explain the Law of Correlation.
16. Give examples from etymology.
17. How associate the *key signatures?*
18. Why should concepts be associated according to the natural relation of things?
19. Give example from Mrs. Radcliffe. What does it show?
20. What is said of logical association? Illustrate.
21. Why is it difficult to memorize the Proverbs of Solomon?
22. Name varieties of inner relations.
23. Give examples of *correlates.*
24. What is said about the search for *causes?*
25. What of *causes* in the study of Harmony?
26. What benefit to the student in learning *causes?*
27. What is a *student?*
28. Explain Plato's definition of a man.
29. Why is broad general knowledge important to music students?
30. State the Law of Repetition. Illustrate.
31. How is the power of *anticipation* produced? Illustrate.
32. Explain the process of coupling notes in a piece of music.
33. State the Law of Interest.
34. Show effect of vividness. Give examples.
35. What is said of *heredity* in connection with association? Give examples.
36. How may a change of emotional state change the direction of association? Illustrate.
37. State the Law of Voluntary Attention.
38. Why is close attention necessary?
39. How are we slaves of association?
40. How is the principle illustrated in the case of *fashions?*
41. How may the principle of association be *practically* applied?

42. What is said of the home and school room environment?
43. Show influence of pictures as educative factors.
44. What about the influence of literature?
45. Value of association in musical education?
46. Examples of the power of music?
47. Use of music in legislation.
48. Give Plato's saying about music.
49. Show influence of pitch on the power of grip.
50. Give the bagpipe illustration, and what does it show?
51. Give examples to show effect of music on the bodily organs?
52. Effects of music on man's moral and intellectual nature?
53. What of music as a curative agent? Give examples.
54. On what ground are these effects to be explained?
55. Why is association a serious thing?

CHAPTER VIII.

Memory.

MEMORY is that faculty of mind by which we retain the knowledge of previous thoughts, impressions, or events, and by which such knowledge is recalled after it has once dropped from consciousness. An act of memory involves several particulars. There is, first of all, the fact of *retention*. When any impression has once been made in the sensitive nerve-center, when the mind has once been the recipient of any facts from without, or has had experience of any thought, or feeling, or volition, such inward experiences, though vanished from consciousness, are not obliterated—they are *retained*. No fact that has ever come into the mind, no concept that has ever orginated in the mind, in short, not a single item of mental experience can ever be annihilated, though it may never return to consciouness, any more than the mind itself can be annihilated. Once in mind always in mind; there is, therefore, no art of forgetting, however poor our memory may be.

A second presupposed fact is that of *recall*, or *reproduction*. Retention alone is not memory; there must be a recall or return of past experiences, of vanished percepts and concepts, into consciousness. Retention may be called the *passive* side, and recall the *active* side, of memory. Besides these, there are some other general facts involved in an act of memory. For instance, there is present the element of *personal*

recognition. Not simply is there a revival of some image or copy of an original experience, but the image is an image of *my own* past experience, and not that of another person. The fact recalled must be thought of as *my* past experience. Then, too, the image must return just as it was experienced, not modified in any way by imagination, neither added to nor diminished; and it must stand in its proper time and space relations. Such are the general facts involved in memory.

Physiological Basis of Memory. What was said in the chapters on Habit and Association should be here recalled, for the facts there developed constitute the foundation of our present inquiry. "The machinery of recall is the same as the machinery of association, and the machinery of association, as we know, is nothing but the elementary law of habit in the nerve-centers" (James).

Attention has been called to the property of *plasticity* in nervous substance, by virtue of which an impression made upon a nerve or nerve-center leaves in the nerve substance a permanent effect as nervous disposition. We have seen also that this property of plasticity lies at the bottom of that acquired *skill* which results in learning things, so that without conscious choice or effort we perform such acts as seeing, hearing, talking, walking, singing, piano-playing, writing, etc. The principle, which underlies and conditions these acts and makes it possible to advance in any art, here comes into view as that on which memory depends.

"The physical basis of memory, as retentive, is laid in the habit, or acquired tendency, of the elements of the nervous system. This tendency has respect both

to the individual elements and to the association of groups of these elements. Each element, speaking figuratively, may be considered as a minute area intersected by an indefinite number of curves of different directions and order. Thus a molecular commotion in any such area may run out into the system along any one of innumerable curves."*

Retentiveness. The physiological theory of memory assumes that memory depends upon a persistent disposition, or tendency of movement created in the brain. There are numerous other theories, but as a physiological basis, the one just stated has the advantage, and we hesitate not to give it our preference. This of course does not mean that we commit ourselves to that materialistic style of thought which sees in memory nothing but the physical property of plasticity in the brain substance; memory ultimately is a faculty of the *soul* and not merely a property of matter. We mean that memory as a faculty of the soul depends upon brain disposition as a means of its operation in the material body. By virtue of the intimate connection between the soul and the body, the soul in its spiritual activities adapts itself to bodily conditions. It is these bodily conditions that experimental psychology has to do with. What the activities of pure spirit are in themselves is a problem of metaphysics and does not belong here. What the soul is in itself and in its pure modes of activity psychology, at least in its present stage, cannot determine. What such terms as "brain disposition," "pathway of discharge," etc., may mean in respect to the essence of the soul we do not know; we use these terms as a basis for the explanation of psycho-physi-

* Ladd, "Outlines of Physiological Psychology."

cal phenomena, such as make up the stream of consciousness and properly come within the scope of our investigation.

Memory being conditioned on brain-paths and brain-disposition, its excellence in a given individual depends, partly on the *number* and partly on the *persistence* of these paths. The persistence of the paths is a physiological property of brain tissue, while their number is due to the range of experience. The native degree of persistence differs very greatly in different individuals and also in different stages and conditions of the same individual. Some men's minds are like wax which yields readily to the seal and retains indefinitely the images stamped upon it—no impressions, however disconnected one from the other, are wiped out, but retain their outline sharp and distinct. Others are like jelly, which vibrates to every touch, but retains no permanent mark. Minds of the latter class recall their past experiences with great difficulty, while those of the former class remember names, dates, figures, anecdotes, gossip, poetry, quotations, notes, and all sorts of miscellaneous facts with the utmost ease.

The activity of memory is greatest in childhood, when the brain substance has the highest degree of plasticity. This is also the period when the great bulk of the materials for subsequent mental development is stored away in the memory to be brought out and elaborated into a connected thought-system. In the first three to five years the child, in addition to the use of all its organs and faculties, learns to know numberless things, together with their various qualities, and to arrange them into groups and series. Jean Paul has said, "Man learns more in the first

three years of childhood than in the three years of college life." We might say that a child learns more in the first ten years of its existence than in all the remaining years of a long life-time. Childhood is the period when the mechanical phase of memory predominates, when everything that offers itself is accepted without asking much about the "how" or the "why." The activity of memory reaches its maximum at about the age of twelve, after which it gradually declines. "With the close of childhood, in the twelfth year, the *orbis pictus* of the man's world of observation, except certain additions reserved for a later age, is closed and laid down in memory; the grammar and vocabulary of the mother tongue are learned, the child is at home in its environment. Colors, tones, names, numbers, persons, things—all are written upon the tablets of the memory."*

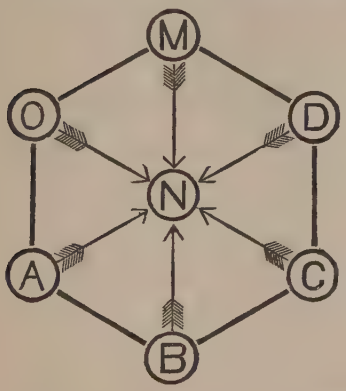
Then comes the period of equilibrium, when we can do no more than hold our own. In the age of manhood memory is stationary. The gathering time is past, the period for the free application in independent judgments and conclusions of what was formerly gathered is at hand. In middle age one learns a new language only with great difficulty, retains names and numbers only with much labor. At this time the old memory-paths fade out about as rapidly as new ones are made in the brain. The decline of memory in this period is connected with the decreasing sensitiveness of the nervous substance, so that in part the long past impressions of childhood even now make themselves felt with greater vividness than the newly gained perceptions of this period.

"In old age the activity of memory shows a rapid

* Lindner, "Empirical Psychology."

decline. The old is forgotten, the new is not retained. Only the most important events, only the concepts most frequently in consciousness emerge like islands out of the universal flood of forgetfulness. It is also true that the very aged man remembers the events of his childhood more vividly than those which lie only a year or two behind him" (Lindner). The brain-paths are so transient that "in the course of a few minutes of conversation the same question is asked and its answer forgotten a half dozen times." The plasticity of the old man's brain substance is nearly spent, analogous to the wood-fibre of a dry stick of timber.

Facility of Recall. The readiness with which past experiences are recalled depends, other things equal, upon the number of paths made in the brain by a wide range of experience or by manifold associations. This idea is illustrated by the following figure, adapted from James:



Let *n* be some past event which it is desired to recall; *a*, *b*, *c*, *d* . . *o* some facts associated with it, and *m* some present thought or fact which may become the occasion or *cue* for the recall of *n*. Let A, B, C, D, M, N . . . O be the nerve-centers corresponding respectively to *a*, *b*, *c*, *d*, *m*, *n* . . . *o* facts. Then A—N, B—N, C—N, D—N, M—N, O—N, are so many brain-paths leading to the centre N; so also A—B—N, A—B—C—N, A—B—C—D—N, etc., in the various ways of grouping,

according as any given present fact is directly connected with the event to be recalled, or indirectly associated with it.

Now, the more there are of such brain-paths as A—N, B—N, etc., bearing in upon the center N, and the greater the number of facts associated directly or indirectly with the fact *n*, which is to be revived, the promter and surer on the whole will be the recall of *n;* the greater the number of things by which one is reminded of the fact to be recalled, the more avenues of approach to it one will possess and the greater facility he will have of recalling his past experiences.

In the words of Prof. James, "The more other facts a given fact is associated with in the mind, the better possession of it our memory retains. Each of its associates becomes a hook to which it hangs, a means by which to fish it up, when sunk beneath the surface. Together they form a network of attachments by which it is woven into the entire tissue of our thought. The secret of a good memory is thus the secret of forming diverse and multiple associations with every fact we care to retain. But this forming of associations with a fact, what is it but *thinking about* the fact as much as possible? *Briefly*, then, of two men with the same outward experiences and the same amount of mere native tenacity, *the one who thinks over his experiences most, and weaves them into systematic relations with each other, will be the one with the best memory.*"*

We see from all this the need of a coherent concept-system. Facts and thoughts should stand associated in the mind according to their inner logical relations, and not in a fantastic manner. Whether we have a

* James, "Psychology."

good memory or not depends very much upon the manner in which we learn the things we wish to remember, and not altogether upon native endowment. The facts and concepts which make up our soul-life should, therefore, stand in a logically coherent system. Every new thing we learn should take its proper place in our growing concept-mass, bound by natural bonds to the facts already in. In a system, every fact is connected with every other fact by some definite thought-relation. Hence every fact so posited in the mind is easily recalled by the combined suggestive power of all the other facts in the system.

Effects of Pathologic Conditions. That the theory above unfolded is in the main correct, receives additional confirmation from certain pathologic conditions of the body. The effects of disease and of the destruction of parts of the brain, upon the memory are such as to suggest, if not conclusively prove, the physiological basis of memory. In cases of injury to the head, persons are known to have forgotten their own names, their native language, everything they ever knew. A certain Mr. Tenent having fallen into a comatose state, and later on into apparent death, on recovering, found that he had lost all knowledge of his past life, and was obliged to commence again the study of the alphabet. After some time his former knowledge suddenly returned to him, as if some physical impediment which obstructed the flow of thought, had been just then removed.

The case of Mezzofanti (Giuseppo Gaspardo—born at Bologna, 1774; Professor of Arabic in the University of Bologna, 1797; librarian to the Vatican, Rome, 1833; made a cardinal, 1838; died, 1849) is in point here. He had an extraordinary memory; before the

close of his university career he had mastered the Latin, Greek, Hebrew, Arabic, Coptic, Spanish, French, German, and Swedish languages. He could speak fluently in thirty languages, and was acquainted in various degrees with seventy-two! When he was installed as cardinal he received congratulations from fifty-three members of the Propaganda, to which he responded, each in his own tongue. A brief attack of fever had the effect to blot out completely his knowledge of the seventy-two languages with which he was acquainted. His memory was entirely suspended; he had lost apparently all his vast stores of knowledge. By and by, upon recovery from the diseased condition of his brain, his memory was restored. The case does not illustrate a "blotting out" of impressions which needed to be imprinted anew on the substance of the brain, but only a temporary obstruction to the use of that which was really in possession.

Sometimes disease has the reverse effect—it brings back to mind what has long since been forgotten. Coleridge cites the case of a German servant girl, who in sickness was heard repeating passages of Greek, Latin, and Hebrew, of whose meaning she had not the least idea. The mystery was solved when it was ascertained that she had formerly been in the home of a learned Rabbi, who was in the habit of repeating aloud, as he walked in his study, favorite quotations from the Iliad, the Aeneid, and the Hebrew Bible. Dr. Rush mentions the case of an Italian who died in New York; in the beginning of his sickness, he spoke English; in the middle period, French; but on the day of his death, nothing but Italian. A Lutheran clergyman of Philadelphia told Dr. Rush that it was not uncommon for the Germans and Swedes of his con-

gregation, when near death, to speak and pray and repeat portions of the catechism in their native tongues, which some of them had probably not used for fifty years and which they had completely forgotten.

Dr. Abercrombie, a distinguished physician of Edinburgh, in a treatise entitled "Inquiries Concerning the Intellectual Powers of Man and the Investigation of Truth," reports the following very remarkable case: "A girl aged seven years, an orphan of the lowest rank, residing in the house of a farmer, by whom she was employed in tending cattle, was accustomed to sleep in an apartment separated by a very thin partition from one which was frequently occupied by an itinerant fiddler. This person was a musician of considerable skill, and often spent a part of the night in performing pieces of a refined description; but his performance was not taken notice of by this child except as a disagreeable noise. After a residence of six months in this family she fell into bad health, and was removed into the house of a benevolent lady, where on her recovery after a protracted illness, she was employed as a servant.

Some years after, she came to reside with this lady. The most beautiful music was often heard in the house during the night, which excited no small interest and wonder in the family; and many a working hour was spent in endeavors to discover the invisible minstrel. At length the sound was traced to the sleeping-room of the girl, who was found fast asleep, but uttering from her lips a sound exactly resembling the sweetest tones of a small violin. On further observation it was found that, after being about two hours in bed, she became restless and began to mut-

ter to herself; she then uttered sounds precisely resembling the tuning of a violin, and at length, after some prelude, dashed off into elaborate pieces of music, which she performed in a clear and accurate manner, and with a sound exactly resembling the most delicate modulations of that instrument. During the performance she sometimes stopped, made the sound of retuning her instrument, and then began exactly where she had left off in the most correct manner.

These paroxysms occurred at irregular intervals, varying from one to fourteen or even twenty nights; and they were generally followed by a degree of fever, and pains over various parts of her body.

After a year or two, her music was not confined to the imitation of the violin, but was often exchanged for that of a piano of a very old description, which she was accustomed to hear in the house where she now lived; and she then also began to sing, imitating exactly the voices of several ladies of the family. In another year from this time she began to talk a great deal in her sleep, in which she seemed to fancy herself instructing a young companion. She has been known to conjugate correctly Latin verbs which she had probably heard in the school-room of the family; and she was once heard to speak several sentences very correctly in French, at the same time stating that she heard them from a foreign gentleman whom she had met accidentally in a shop. Being questioned on this subject when awake, she remembered having seen the gentleman but could not repeat a word of what he said. During the whole period of this remarkable affection, which seems to have gone on for ten or eleven years, she was, when awake, a dull, awkward girl, very slow in receiving any kind of instruction,

though much care was bestowed upon her; and, in point of intellect, she was much inferior to the other servants of the family. In particular she showed no kind of turn for music. About the age of twenty-one she became immoral in her conduct, and was dismissed from the family. It is believed that she afterward became insane.

What significance have these facts to the psychologist? They strongly suggest the physiological basis of memory. They show that changes in the bodily state are accompanied by corresponding changes in the condition of memory. In the words of another, "The adult brain is a system of vastly intricate and interrelated molecular mechanism. It has been during its entire history, in the process of vital organization of these intricate interrelations. The particular brain-processes concerned in each act of reproduction all fall under the laws which control the general biological process of perpetual organization.

The mental phenomena are a series of related 'circuits of consciousness,' overlapping and fading into each other. The brain-processes are a succession of related nerve-commotions in centres contiguous and distant,—also overlapping and fading into each other."*

Personal Element in Memory. When we have referred the phenomena of retention and recall to a physiological basis, and perhaps have succeeded in giving a reasonably satisfactory explanation, there is still something in the nature of memory which cannot be explained on this hypothesis. There is an "unexplored remainder," which escapes the physical tests of the biologist; there is the *personal* element, the

* Ladd, "Outlines of Physiological Psychology."

conscious recognition of facts and events as *my own* experiences, which is the grand peculiarity, the profound mystery, of memory,—an element grounded in spiritual being, an affair of mind, a characteristic of personality.

The teachings concerning organic memory are doubtless true so far as the organism is concerned, i. e., considering the brain as an *instrument* of mind in the function of memory; but behind the *instrument* is the *user of the instrument.* In the *user of the instrument,* in the *agent* conditioning the *agency* stands the personal element, the *conscious recognition* implied in every act of memory, the *truly distinctive* part of memory; and this is spiritual, personal.

The remembered past must be attributed to some ego, some mind, some personality. There is no *memory-image*, that does not involve the conscious recognition of that particular image, as representative of *its own past*, by the same mind. Conscious recognition, as truly as retention and recall, belongs to memory as a psychical fact. But conscious recognition as a psychical fact implies a conscious ego, a personal self, a spiritual power, a soul in freedom. "We cannot even conceive of the nature of the physiological process which would serve as an 'explanation' in any sense of the word but for this characteristic of recognition, this self-appropriation as belonging to the past of the same ego, or mind, which enters into all conscious memory. All that any physiological process could possibly explain, in case we knew its nature most completely, would be why I remember one thing rather than another—*granted the inexplicable power of the mind to remember at all*

(i. e., to recognize consciously the present state as representative of its own past). This power is a spiritual activity wholly *sui generis*, and incapable of being conceived of as flowing out of any physical condition or mode of energy whatever."

Varieties and Wonders of Memory. There are many varieties of memory, and writers on the subject record many examples of its extraordinary development. Some are characterized by a remarkable power to *remember names*. Themistocles could call by name all the citizens of Athens, when that city numbered over 20,000 inhabitants. Cyrus according to Pliny knew the name of every soldier in his vast army. Dr. Stewart mentions the case of a young Corsican at Padua, who could repeat, without hesitation, 36,000 names in the order in which he heard them, and then reverse the order and proceed backward to the first.

Pontius Latro could repeat *verbatim* every speech he had ever heard in the Roman senate.

Some memories are remarkable for their power of holding figures and using them in performing difficult mathematical operations. Dr. Wallis of Oxford, one night in bed, proposed to himself a number of fifty-three places, and found its square root to twenty-seven places, and, without writing anything down, dictated the result twenty days afterward. It was not unusual for him to perform mathematical operations in the dark, e. g., extracting roots to forty decimal places.

The distinguished Euler, blind from early life, had always in his memory a table of the first six powers of all numbers, from one to one hundred. On one occasion two of his pupils, calculating a converging

series on reaching the seventeenth term found their results differing by one unit at the fiftieth figure and in order to decide which was correct, Euler went over the whole in his head, and his decision was found afterward to be correct.

Then there are those who possess extraordinary power to retain and recall dates, facts, things, incidents, etc. Pascal, the distinguished French author, never forgot anything he had read or heard or seen. Perhaps the most remarkable case is that of Magliabechi, librarian to the Duke of Tuscany. He could inform any one who consulted him not only who had treated directly of any particular subject, but also who had indirectly touched upon it in treating of other subjects, to the number of perhaps one hundred different authors, giving with the greatest exactness the name of the author, name of the book, the words, often the page, where they were to be found.

To test his memory, a gentleman of Florence lent him once a manuscript which he had prepared for the press, and, some time afterwards, went to him with a sorrowful face and pretended to have lost his manuscript by accident. The poor author seemed inconsolable, and begged Magliabechi to recollect of it what he could, and write it down for him. He assured the unfortunate man that he would do so, and setting about it, wrote out the entire manuscript without missing a word!

He had also a wonderful *local memory*. He knew where every book in the great library stood. One day the Grand Duke sent for him to inquire if he could procure a book which was very scarce. "No, sir," answered Magliabechi, "it is impossible; there is but *one* in the world; that is in the Grand Seignior's

library at Constantinople, and is the *seventh book, on the seventh shelf, on the right hand as you go in.*"

Some men have an extraordinary *musical* memory. The example of young Mozart writing out in full the *Miserere* of Allegri is well known. The *Miserere* is a part of the service used in the Pope's chapel in Rome, sacredly guarded and kept with great care in the archives of the chapel. Any singer found tampering with this *Miserere* of Allegri, or giving a note of it to an outsider, would be visited by excommunication. Only three copies of this service have ever been sent out. One was for Emperor Leopold, another to the King of Portugal, and the third to the celebrated musician, Padre Martini.

But there was one copy that was made without the Pope's orders, and not by a member of the choir either.

When Mozart was taken to Rome in his youth, by his father, he went to the service at St. Peter's and heard the service in all its impressiveness. Mozart, senior, could hardly arouse the lad from his fascination with the music, when the time came to leave the cathedral. That night after they had retired and the father slept, the boy stealthily arose and by the bright light of the Italian moon, wrote out the whole of that sacredly guarded *Miserere*. The Pope's locks, bars and excommunications gave no safety against a memory like Mozart's.

Another instance is mentioned of this master's power of memory. He had promised to write a piano and violin sonata for Mad. Schlick, the great violinist. Instead of attending to his promise, he went to work on other things, and postponed the sonata until a few days before the concert, when the

new work was to be played. Mozart then composed the sonata in B flat major, and had the entire work ready in his mind, but still delayed the odious task of writing it down. A day before the concert the lady was terrified, having not yet received the manuscript from the composer. She at once sent a servant to remind him of his duty, whereupon Mozart hastily wrote out the violin part and sent it to the lady. In the concert, however, he played his own part from memory, having never played it before.

There are musicians who remember as many as twenty, thirty, and even forty operas, each of which would fill an evening. The blind flutist Dullon knew 125 concertos by heart and distinguished each by a certain number.

Charles Wesley could play the whole of Händel's numerous choruses from memory. Samuel Wesley has given many remarkable instances of a similarly retentive memory; one of the most remarkable may be mentioned. In his early days he composed an oratorio consisting of a score of upward of three hundred closely written manuscript pages. It was afterwards performed at one of the Birmingham festivals. Returning to London the composer was robbed of his portmanteau, which contained this work, and he never again heard of its contents. Nearly twenty-five years afterward, at the solicitation of a friend, he commenced to write it out afresh, which he did with the greatest facility, stating that he saw the score in his mind's eye as accurately and distinctly as if it lay before him.*

Cultivation of Memory. That there are great initial differences among individual memories in respect to

*Gates, "Anecdotes of Great Musicians."

facility of recall is a matter of common observation. Some are naturally gifted with a fine memory while others must struggle all their life time to retain what they have gained. As Locke has said, "In some persons the mind retains the characters drawn on it like marble, in others like freestone, and in others little better than sand." But whether a memory be good or faulty, it is capable of cultivation to an indefinite degree. A man never knows his possibilities until he tries. No one, however poor his memory may be, needs to despair, for by proper training the poorest of memories may be indefinitely improved. Prof. Norton H. Townshend of the Ohio Agricultural College, at the age of five years received an injury from a fall by which his memory was almost destroyed. What he had learned before had to be acquired again. A lesson carefully prepared was forgotten before recitation time. When sent on an errand he had to return to ask what he had been sent for. Driven almost to despair by such experiences, he set about a systematic course of memory training, and in process of time succeeded so well that he surpassed all his companions in power of memory. Thurlow Weed, the famous journalist, relates that his memory was like a sieve. He set about improving his memory, and at length attained a power as remarkable as was his previous weakness. His method was the simple but effective one of recalling every night what he had done during the day.

As to the best means and methods of memory training there is great diversity of opinion. Numerous books have been written on the art of improving the memory, and various schemes have been devised for that purpose; but many of them are based on partial

or erroneous views of the true principles of memory, and are, therefore, of little or no real value, tending rather to distort than to improve and strengthen the memory. Every true method must be based on an intimate knowledge of the nature of memory, and the principles on which it acts.

When we remember that all progress in knowledge, in fact, our whole psychic life, depends on memory, we can understand how important its proper cultivation is. Dr. Hering says: "It seems that we owe to memory almost all that we have or are; that our ideas or conceptions are its work, and that our every perception, thought and movement is derived from this source. Memory collects the countless phenomena of our existence into a single whole .... Our consciousness would be broken up into as many fragments as we have lived seconds but for the binding and unifying force of memory."

According to Prof. Bain, "memory is the faculty that most of all concerns us in the work of education .... All improvement in the art of teaching depends on the attention that we give to the various circumstances that facilitate acquirement or lessen the number of repetitions for a given effect."

The following suggestions will be found helpful in memory culture:

First, Proper Physical Conditions. If memory has a physiological basis, and if the facts stated in the paragraph on pathologic conditions have any significance, it follows that a sound physical state is the first condition of a good memory. Whatever affects the general health must also affect the memory. Indigestion, a torpid liver, headache, weariness of body, a vitiated atmosphere, insufficient nourishment, etc.,

all affect the condition of the brain and in a degree also the memory.

There must be a sufficient supply of good healthy blood, and its free circulation must not be impeded. All mind action and brain action is connected with the flow of blood. When there is intense brain action a powerful current of blood is sent into that organ to supply fresh material and carry off the worn-out cells. The "balancing experiment" shows this. The human body is very delicately balanced in a horizontal position, while the mind is in a state of indifferent activity. If now in this condition of perfect equipoise the subject's mind is suddenly excited, the head end of the body is found to go down, showing that an increased quantity of blood has been brought into the brain. The same thing is shown also in other ways. The phenomena of paleness in the face by fainting, of blushing, of cold feet while studying hard, etc., are indirect proofs of the varying blood distribution according to the degree of mental activity.

That these physical conditions indirectly affect the memory is reasonably certain. A man with a naturally fine memory was taken sick, and, on recovering, he suffered for nearly a year from feeble heart action. During this time he complained of not being able to remember scarcely anything. As soon as his heart action became normal he regained his usual vigor of memory. Isaac Taylor says, "that this organic mental faculty of memory, as at present possessed even by the most highly favored individuals, is susceptible of much enhancement and extension, merely by an improvement of the corporeal constitution." A normal exercise of the memory supposes an active circulation and blood rich in the materials necessary

for integration and disintegration" (Th. Ribot). "Disturbances to the memory may arise from too feeble circulation through the brain as well as from over-excitement or congestion of the blood there" (Sir H. Holland).

When the body is fresh and vigorous, plentifully supplied with healthy arterial blood, impressions are easily made, and are usually lasting. But when the body is exhausted by fatigue, or suffers from want of nourishment or impoverishment of blood, the impressions will be slight and made with difficulty. Bodily vigor is thus the foundation of a good memory. It is true that some persons of feeble body have possessed powerful memories; but a person in health always remembers better than when weakened by disease.

Therefore, pay attention to the laws of hygiene. Keep the health of the body at the high water mark. Take sufficient exercise and exercise of such a kind as will call into action every muscle and every nerve of the whole body. It is a mistake to sit in your room a whole day long trying to memorize a piece of music, till you become weary and nervous. Go out sometimes and engage in some kind of physical exercise, it does not matter much what it is, until the blood is made to course through every vein and artery and capillary, and the flush of new life comes into your cheeks. Then, after a few moments of rest, resume your task and you will accomplish far more than you could possibly do by the painful process of continuous poring; and, what is still better, you will train your memory in the right way, so that you will retain far more easily what you learn. Avoid all kinds of dissipation, and the use of stimulants to

brace up a depleted nervous system. Every advantage gained by resorting to such practices is only temporary and at the expense of the delicate nervous tissue. In the end the effect is to lower the bodily tone and weaken the memory.

Secondly, Clear Perception. Whether a given idea or fact will be easily recalled depends largely upon the way the fact is learned. If the perception is indistinct and the mental image vague, it will soon fade from memory. Indistinctness of mental image, haziness of perception, lies at the root of many a bad memory. Learn to see and hear things sharply and accurately. That which is treasured up and recalled in memory is the impression made upon the mind itself by the sensation of idea, and unless this is clear and distinct that which is recalled will be imperfect. Therefore, we must attend carefully to the formation of the original impression. "When the impression that is formed in the mind is clear, distinct, and vivid, it will be readily reproduced with much of its original character and force; but when, on the other hand, it is indistinct, hazy, ill-formed, it will be recalled with difficulty, and only in a very imperfect manner."* Anyone can easily verify these statements by his own experience. That which we have observed most sharply, we recall most easily. Objects distinctly beheld are longest retained in the mind and most readily recalled.

Cultivate the *visualizing* habit, i. e., make every concept stand out with the distinctness and completeness of a sharply formed image. When you memorize a piece of music, make the notes and bars and lines stand forth like a picture in the mind; then also

*Kay, "Memory: What It Is, and How to Improve It."

the auditory image of the sounds should be as sharp as that which appears to the eye. Photograph, as it were, on the retina measure after measure, page after page with such distinctness and accuracy that afterwards you can repeat their contents note for note and word for word, just as if you were reading them from the printed page. This in turn will form a brain habit of remembering things pictorially, and hence more exactly and with greater interest. "The best workmen," says Sir Francis Galton, "are those who visualize the whole of what they propose to do before they take a tool in their hands." The remark is applicable also to the musician; he should have a clear image of the notes before attempting to play or sing them.

In the same connection it should be observed that the *first impression* of an object made on the mind is of special importance in respect to memory. Novelty generally awakens interest, and when an object is perceived under the excitement of heightened interest, it usually makes a lasting impression. If curiosity is strongly excited about a thing it becomes readily fixed in the memory. "As a rule the mind looks upon a thing with more interest, and its curiosity is more excited concerning it on its first appearance than on any subsequent occasion. Hence, the first occasion of an impression reaching the mind is always the most favorable for fixing it in the memory. Each subsequent recurrence of it renders it more familiar to the mind, which is therefore less curious about it; and, besides, the repeated appearance of the same impression under different circumstances tends to diminish the clearness and distinctness of the original." Mr. Galton observes "that the first image most

people have acquired of any scene is apt to hold its place tenaciously in spite of subsequent need of correction . . . . If they see an object equally often in many positions, the memories combine and confuse one another, forming a composite blur which they cannot dissect into its components. They are less able to visualize the features of intimate friends than those of persons of whom they have caught only a single glance."

Thirdly, Rational Association. In the chapter on Association this principle was fully explained. It remains here simply to point out its application to the memory and to memory training. When things are rationally associated in one's concept-mass, that is, according to their inner thought-relations, such as those of cause and effect, instrument and use, means and end, etc., they are more easily retained and recalled than when not so associated. If we reflect on the fundamental facts of association we shall see the reason for this. Each new mental acquisition should be linked by some logical thought-relation to old facts already in the mind. Order and classification of facts to be remembered are necessary. "Nothing," says Prof. Blackie, "helps the mind so much as order and classification. Classes are always few, individuals many; to know the class well is to know what is most essential in the character of the individual, and what burdens the memory least to retain."

Hence, the need of a concept-system in regard to everything we learn and wish to retain. Facts thrown together into the mind in a state of isolation and confusion are hard to recall; besides, the habit of doing so weakens the power of memory. The wise

man brings things into his mind in their right relations; he insists upon order and classification in his knowledge; facts are grouped according to their genera and species, and nothing lies loose in his mind.

In the following example quoted by Prof. Gordy, from "Tate's Philosophy of Education," notice the effect on memory of grouping ideas according to their natural relations:—

"Betty," said a farmer's wife to her servant, "you must go to town for some things. You have such a bad memory that you always forget something, but see if you can remember them all this time." "I'm very sorry, ma'am," said Betty, 'that I've such a bad memory, but it's not my fault; I wish I had a better one." "Now mind," said her mistress, "listen carefully to what I tell you. I want suet and currants for the pudding." "Yes, ma'am, suet and currants." "Then I want leeks and barley for the broth, don't forget them." "No, ma'am, leeks and barley; I shan't forget." "Then I want a shoulder of mutton, a pound of tea, a pound of coffee, and six pounds of sugar. And as you go by the dressmaker's, tell her she must bring out calico for the lining, some black thread and a piece of narrow tape." "Yes, ma'am," says Betty, preparing to depart. "Oh, at the grocer's get a jar of black currant jam," adds the mistress. The farmer who has been quietly listening to this conversation, calls Betty back when she has started, and asks her what she is going to do in the town. "Well, sir, I'm going to get tea, sugar, a shoulder of mutton, coffee, coffee—let me see, there's something else." "That won't do," said the farmer; "you must arrange the things as the parson does his sermon, under heads, or you won't remember them. Now, you have three things to think of—breakfast, dinner and dressmaker." "Yes, sir." "What are you going to get for breakfast?" "Tea and coffee and sugar and jam," says Betty. "Where do you get these things?" "At the grocer's." "Very well. Now, what will be the things put on the table at dinner?" "There'll be broth, meat and pudding." "Now, what have you to get for each of these?" "For the broth I have to get leeks and barley, for the meat I have to get a shoulder of mutton, and for the pudding I

must get suet and currants." "Very good. Where will you get these things?" "I must get the leeks at the gardener's, the mutton and suet at the butcher's, and the barley and the currants at the grocer's." "But you had something else to get at the grocer's." "Yes, sir, the things for breakfast—tea, coffee, sugar and jam." "Very well. Then at the grocer's you have four things to get for breakfast and two for dinner. When you go to the grocer's think of one part of his counter as your breakfast table and another part as your dinner table, and go over the things wanted for breakfast and the things wanted for dinner. Then you will remember the four things for breakfast and the two for dinner. Then you will have two other places to go for the dinner. What are they?" "The gardener's for leeks, and the butcher's for meat and suet." "Very well. That is three of the places. What is the fourth?" "The dressmaker's to tell her to bring out calico, thread and tape for the dress." "Now," said the master, "I think you can tell me everything you are going for." "Yes", said Betty, "I'm going to the grocer's, the butcher's, and the gardener's. At the grocer's I'm going to get tea, coffee, sugar, and jam for breakfast, and barley and currants for dinner. But then I shall not have all the things for dinner, so I must go to the butcher's for a shoulder of mutton and suet, and for leeks to the gardener's. Then I must call at the dressmaker's to tell her to bring lining, tape and thread for the dress." Off goes Betty and does everything she has to do. "Never tell us again," said her master, "that you can't help having a bad memory."*

Cramming, that is, preparing a lesson by committing 'points' to memory simply for the sake of reciting them brilliantly, is a bad mode of study, and weakens the memory. Habits of continuous, persistent application should be enforced, whereby the mind grows in a normal way. The lesson must be studied for the purpose of gaining general mental strength, and then also the memory will be strengthened in the same proportion. Nothing is better as a means for improving the memory than general intelligence and systematic study. If the memory is to be

*Gordy, "Lessons in Psychology."

retentive, there must be given it something to do; it grows strong by exercise, just as the muscles of the athlete grow by persistent use. Fill the mental storehouse with facts of knowledge, not *crammed* into the mind, but thoroughly *studied*.

It is vain to rely on artificial methods, such as are usually set forth under systems of mnemonics; after all, there is only one way, and that is *hard study*, thorough, earnest study. One lesson thoroughly and perfectly understood, one etude mastered in all the points of its contents, will do you more good than ten lessons or ten etudes superficially gone over or mechanically crammed into the mind. Without careful study there is no mental growth, no progress in unfolding the potentialities of the soul. Other things may be seized on by might, or purchased by money; but knowledge is to be gained only by study.

"Learning by heart" is not memory-training; it tends to a mechanical habit of committing *words*, not *ideas*, to memory. As Locke says, "Learning by heart, I know not what it serves for but to misspend the time and pains of pupils, and give them a disgust and aversion to their books." Pope in the "*Dunciad*" thus satirizes this practice:—

> "Since man from beast by words is known,
> Words are man's province, words we teach alone."

In a similar strain Shakespeare makes two of his characters say:—

> "What do you read, my lord?"
> "Words, words, words!"
>
> —*Hamlet, Act II.*

Committing simply words and notes without at the same time associating with them the ideas they stand for, has little disciplinary value and certainly

is time lost and energy spent in vain. Gain ideas, gain knowledge of the piece you are memorizing and of the composer. *Study*, really *study*, the masters, and observe with what a sweep of thought they range over the field of their subject. That kind of mental exercise agrees with the nature of the mind and strengthens the memory. "Never be satisfied with the surface of things; probe them to the bottom, and let nothing go till you understand it as thoroughly as your powers will enable you. If you are working on a classic composition, while you are learning the outward form of it as it appears to the eye and ear, learn also the secret *thought*, the informing soul, that speaks through the outward form." It may be a slow and, perhaps, at first a tedious process, but it yields excellent results. Good memory is good *knowing*. The great thing in memory training is to give the memory plenty of logically associated ideas to hold. "Memory exercised is memory trained."

Fourthly, Close Attention. Attention is necessary for the cultivation of memory. Perhaps the defects of memory, of which most persons complain, are due more to the want of attention than to any other cause. It is a matter of universal experience that what we attend to we remember, but what we do not attend to we readily forget. By attention (*attendo*, to stretch towards) is meant that attitude or state of mind by which its energy is voluntarily fixed upon some one particular object or act or idea, to the exclusion for the time being of all other things. As the etymology of the word suggests, an act of attention implies an active exertion of energy, a concentration of thought, an application of will; it therefore signi-

fies that the soul is wide awake when it is in a state of attention.

"Memory is very much influenced by attention or a full and distinct perception of the fact or object, with a view of its being remembered."—Dr. Abercrombie.

"It is a matter of common remark that the permanence of the impression, which anything leaves on the memory, is proportioned to the degree of attention which was originally given to it."—D. Stewart.

"The experiences most permanently impressed upon consciousness are those upon which the greatest amount of attention has been fixed."—D. G. Thompson.

"An act of attention, that is, an act of concentration, seems thus necessary to every exertion of consciousness, as a certain contraction of the pupil is requisite to every exertion of vision . . . . Attention, then, is to consciousness what the contraction of the pupil is to sight, or to the eye of the mind what the microscope or telescope is to the bodily eye . . . . It constitutes the better half of all intellectual power."—Sir William Hamilton.

"The force wherewith anything strikes the mind is generally in proportion to the degree of attention bestowed upon it. The great art of memory is attention . . . . Inattentive people have always bad memories."—Dr. J. Beattie.

From the nature of the case, the mind can attend to but one thing at a time. According to Bain, a plurality of stimulations of the nerves may coexist, but they can affect consciousness only by turns, or one at a time. "It is established by experience," says M. Jouffroy, "that we cannot give our attention to two different objects at the same time." Sir

William Hamilton states this principle in the form of a law, namely, "that the intension of our knowledge is in the inverse ratio of its extension—i.e., that the greater the number of objects to which our consciousness is simultaneously extended, the smaller is the intensity with which it is able to consider each, and consequently the less vivid and distinct will be the information it obtains of the several objects . . . When our interest in any particular object is excited, and when we wish to obtain all the knowledge concerning it in our power, it behooves us to limit our consideration of that object to the exclusion of others."*

There is a great variety of cases in which the mind apparently exerts different acts of attention at one and the same time; but knowing the incalculable rapidity of the thought-processes, it is obvious that all such cases may be explained without supposing those acts to be coexistent. For example, in a concert of music a good ear can attend to the different parts separately, or can attend to them all at once, and feel the full effect of the harmony. In this case, however, the mind does not attend to several things at the same time; but it constantly transfers its attention from one part of the music to another, and its operations are so rapid as to give us no perception of any interval of time between its separate acts. Strong objections have, indeed, been urged against this doctrine; but we think a close examination of all the facts in the case will result in an affirmative decision.

The power of attention, the power of fixing the mind upon a particular object till it has been thoroughly mastered, more than anything else dis-

*Hamilton, "Methaphysics," ed. by Bowen, p. 159.

tinguishes the man of genius from others. Indeed, genius has been defined as "the power of concentrating and prolonging the attention upon any given subject." Sir Isaac Newton, in describing his method of study, said: "I keep the subject continually before me, and wait till the first dawning opens slowly by little and little into a clear light;" and, when complimented on his great discoveries, he modestly replied, "that if he had made any improvements in the sciences, it was owing more to patient attention than to any other talent." On the other hand, the want of power to hold attention upon any one thing for any length of time is a mark of a weak mind. "Imbeciles and idiots", says Esquirol, "are destitute of the faculty of attention." According to an authority, "one of the most constant and characteristic symptoms of coming insanity is a debilitated power of attention . . . The growing deficiency of attention points to a coming imbecility, and especially to an impending attack of softening of the brain."

The bearing of all this upon the memory is apparent. He who would have a powerful memory must be able to concentrate his attention. Says Joseph Cook, "Attention is the mother of memory, and interest is the mother of attention." The evil of reading or playing mechanically or automatically is immediately inferred. When you read a book or play a piece of music you must not allow the mind to fall into a passive state, for that will weaken the memory. Persons who never summon their will power to aid them in tracing out the thought contained in the composition in hand, are sure to forget the next moment what they learned the moment before. But this is not all; the

worst of it is that the memory is thereby abused, incapacitated for better use.

Fifthly, Constant Repetition. As the ground of this principle has already been fully explained in connection with the formation of habits we need not here farther elaborate it. The fact is that simple repetition of an act causes that act to be more easily recalled than one not so repeated. It is a law of our system by which actions at first requiring much attention and effort are after frequent repetition performed much more easily, or even without conscious effort. This is exemplified in various acts of daily life, such as reading and writing, but in a most remarkable degree in music. At first the notes must be carefully scanned one by one as they stand upon the staff, and the keys on the instrument must be hunted out, and the placing of the fingers must be watched, all of which is a slow and painfully conscious process; but with frequent repetition of the same acts in the same way facility is gained, and by and by the most rapid movements are performed with the minimum of attention and effort.

Dr. Carpenter says: "The aptitude which is acquired by practice for the performance of certain actions that were at first accompanied with difficulty, seems to result as much from a structural change which the continual repetition of them occasions in the muscles, as in the habit which the nervous system acquired of exciting movement." And Th. Ribot adds, "After each action a muscle is better prepared for action, more disposed to a repetition of the same work, and readier to reproduce a given organic process." Thus, what was at first accomplished with difficulty, by and by becomes second nature, so that no effort is required

to perform it. The effect of practice shows that the more frequently the same fibres are thrown into action, the easier does their action become.

Thus, strength of memory and of mind comes by practice, just as strength of muscle is developed by constant use. Milo, the Greek athlete, could carry the ox on his shoulders, because earlier he carried the calf day after day. He developed his extraordinary physical strength by oft-repeated daily exercise; so must strength of memory be cultivated, namely, by patiently and persistently doing the same thing over and over again. Nor should this be a *blind* repetition, a mere task exercise, a treadmill performance. In proportion as it is done with thought and intelligence, it can be made interesting and invigorating. If we bring into our daily exercises a laudable ambition and resolute will to make the very best use of our time and opportunities, it affords us real satisfaction to find that with each day's routine of practice we are gaining in strength and facility and are better prepared for the next step. By infusing interest into our work we shall be able more and more to beguile our moments of toil, the drudgery of our tasks, into pleasant occupation and invigorating exercises. This leads to the mention of,

Sixthly, The Principle of Interest. If interest can be brought to the aid of memory, the battle is half won. Boys, who apparently can remember nothing pertaining to their studies, are able to recall with the utmost ease and with perfect accuracy every move in a game of base ball or a game of checkers, because they are intensely interested in the game.

As a matter of experience, we know that whatever we are deeply interested in we easily remember. When

the learner becomes interested in his music work he has little trouble to remember what he has learned. Looking at things from the standpoint of *results* ofttimes has the effect to arouse interest in things to which otherwise we are indifferent. Thus, when students discover that the study of psychology is a great advantage to them in the pursuit of their music studies, they become interested in the subject.

The philosophy of illustrations in spoken and written discourse rests, in large part, on this principle of interest. We know what effect a happy illustration has to fix a given fact or statement in the memory. By the use of illustrations we link abstract ideas with concrete things. What we can see, hear, or touch, is more interesting than what we try to hold in abstract thought. On the same principle depends the use of figures of speech, pictures, maps, charts, object lessons, etc. Teaching by *parables* and *fables* is another example of the same kind. Who can forget the truth taught by the parable of the sower, the good shepherd, the prodigal son? As long as the world stands men will remember the beautiful parables, the masterly word-pictures of our Saviour. So likewise the familiar fables, such as those of the wolf and the lamb, the fox and the sour grapes, the lion and the ass, cling to our memory, when many other things fade almost as soon as learned.

Here also is to be noted the use of *stories* in teaching children. Story-telling is a great and useful art. He who knows how to do this well is a good teacher of children and youth. He who can lodge a great truth in the mind of childhood by means of a good story, invests that truth with a permanent interest

and fastens it in the memory of the child never to be forgotten.

Nora Archibald Smith has written a delightful chapter on the importance of the story in child education, which we wish to recommend to all students and teachers. She says: "As you follow the dusky track of the twilight as it tiptoes round the world, in land after land, you and the twilight together will steal upon a little circle of children gathered about the knees of a story-teller. . . . Earth is circled with this vast company of story-tellers, nightly surrounded by their little ones, black, and white, and red, and brown, and yellow; their eager, upturned faces and eloquent voices all uttering the same plea, 'Tell us a story! Oh, tell us a story!'

What is the secret of the charm which story-telling has for the child? Is it not first, perhaps, the fact that it interprets life—wonderful, mysterious, fascinating life—to him, and places in his hand a sort of telescope, through which he eagerly peers into the world across the threshold of his nursery? Is it not, again, that it addresses the imagination—his dominant power, his delight, his way of escape, that he may be able to bear the dullness, the denseness, the want of comprehension, of the grown-up world?"*

NOTE—It is a matter for congratulation that in recent days the use of stories has been introduced into music teaching. This principle is happily illustrated in an exceedingly bright and beautiful publication recently issued by Miss Nettie Delphine Ellsworth with the title "Little Journeys in Melody Land." It is a step in the right direction, and is one of the fruits of mind-study as applied to music. It is to be hoped that others will be stimulated to use their talents in the interests of childhood and music in the same direction. Another similar fruit of the study of Psychology in recent

* Nora Archibald Smith, "The Children of the Future."

times is the introduction of the Kindergarten method into the musical instruction of children. We see in all this how the principle of *interest* is gaining ground in learning and teaching music.

The Pedagogical Value of Memorizing Music. In recent times it has become the custom of many music teachers to require their pupils to memorize most or all of the lessons they recite. Also at concerts and recitals it is customary to play without notes. This practice has important pedagogical bearings, and from the standpoint of psychology has many things to be said in its favor. Too much stress cannot be laid on the fact that memorizing leads to a closer study of the best music, a more thorough comprehension of it, and a more intelligent appreciation of what it contains.

Then, too, this practice has an important influence on technique, in that "it leads to ascertaining more and more perfectly the precise points of difficulty which hinder the easy performance of a given passage." Difficulties are often overcome by memorizing the passage in which they occur; in all cases they are very much diminished. When the mind knows clearly and certainly where it desires to carry the musical thought, the fingers manage to perform their part. We have before pointed out the necessity of having *thought* behind the fingers in order that the fingers may do their work to the best advantage, and here now this doctrine finds both its application and illustration. We know how important technique is in playing. But the best technique is that which springs from clear musical thought, from a mind well stored with accurate knowledge and a heart overflowing with tender emotion. In order to make use of thought and feeling in the act of playing it is much

better if the music has been memorized so that *all* of the attention may be fixed on the contents of the piece.

In the way of correct musical perception and the formation of a right musical style much could be said in favor of memorizing. "A Bach fugue cannot possibly be well played without memorizing until after the pupil has acquired a great deal of experience in this class of music; and even then the performance of any fugue will be greatly improved by memorizing. It will not be necessary to do much criticism, if the piece is studied by a fairly competent pupil; merely memorizing and the influence of the music itself will transform the playing and render it definite and effective. Such style-forming pieces as the Chopin Etudes must also be memorized, if we want their full effect. Pleasing pieces at all stages of the progress are memorized for the convenience of having them handy when one wants to play them; and for the additional reason that this is part of the process of completely learning them."

Without this thorough acquaintance with a piece of classic music involved in the act of memorizing it, the pupil is apt to have a poor perception of its beauties, and his style of execution will be correspondingly deficient. How, for instance, would an actor get along in the impersonation of Hamlet or Othello if he did not memorize his part? Before he can take the first step towards a good style of acting he must have a keen perception of what the piece contains in all its relations, and this is possible only by having the whole of it before his mind at once. There is no other way of getting into the 'merits' of the drama than by thoroughly memorizing it and then studying each detail as he sees the piece in its entirety

before his mind. Before this is done it is not possible for him to shut out of mind every other object, every other idea, a condition so necessary for the highest degree of dramatic power. The tragedian who can so throw himself into his character or subject as to be oblivious of everything but that, is the one that is most natural and therefore moves the audience most powerfully. It is said of Mrs. Siddons that she was wont to throw herself into the character of the person she was representing to such a degree that she would lose sight of her own personality, would become so completely engrossed in the part she was playing, as to *be*, for the time, rather than *act*, the character assumed. The same principle holds in the performance of a great piece of music, and the same reason for memorizing applies. A true style of rendition cannot be otherwise formed.

Closely connected with this is another advantage of memorizing music, namely, *liberty of performance.* Listen to the words of Dr. Mertz: "Not only does it enable him to afford pleasure to willing listeners at any time or place, but by playing or singing without the aid of notes, he is free, and is thereby enabled to perform with more liberty and sentiment. The close musical reader is fettered, a good share of his mental activity is expended upon reading the notes, upon observing expression marks, while, if he were free from his bondage, he could throw his whole soul into the performance. The musician who sings or plays from memory is a second-hand improviser, he forgets self, he lives in the music and not in the notes or in his surroundings. This is the reason why musicians prefer to play from memory, and it is the lack of this faculty that keeps so many respectable players from

soaring aloft on the wings of their imaginations. The musician who plays from memory is as the bird that flies unfettered; the musician, however, who is tied to his notes, is as a bird that is tied to a string."*

A few general hints may here be given. All rules and practical hints as to musical memorizing must be based on a knowledge of the human mind. He who would use the mind, whether his own or that of his pupil, must know the mind. We have seen that the maximum of memory-development is reached at the age of about twelve to fourteen years. The memory of youth is far more vigorous than that of more advanced years. It follows that during this period the memory should receive special attention. The best time of the day for memory work is in the morning, because then the mind is free and the brain substance yields more readily to impressions. There is sound practical wisdom in the German adage:—

"Die Morgenstunde
Hat Gold im Munde."

QUESTIONS.

1. Define memory.
2. Name three elements involved in an act of memory. Explain each.
3. Describe the physiological basis of memory.
4. Explain the physical basis of *retentiveness*.
5. What is said of memory as a faculty of the *soul?*
6. On what does excellence of memory depend?
7. What is said of the native persistence in different people? Illustrate.
8. When is the activity of memory greatest, and why?

* Mertz, "Music and Culture."

9. What of the child's acquisitions in the first five to ten years of its life?

10. When and what is the *period of equilibrium?*

11. What of memory in old age? Explain.

12. On what does *facility of recall* depend?

13. Explain diagram.

14. Give substance of quotation from James.

15. Show need of coherent concept-system in relation to memory.

16. Object of referring to various pathologic cases?

17. Give case of Mr. Tennent, and what does it show?

18. Give case of Mezzofanti, and what does it prove?

19. What does the case of the German servant girl illustrate? Give other similar cases.

20. Give case reported by Dr. Abercrombie.

21. What significance have these facts to the psychologist?

22. What is said of the *personal* element in memory?

23. What of *varieties* of memory?

24. Give examples of memories remarkable for the power of recalling *names.*

25. Give examples of memories remarkable for remembering *figures.*

26. What does the case of Magliabechi illustrate?

27. What is said of Mozart's memory? Give examples.

28. Give example of Samuel Wesley.

29. Facts about *cultivation* of memory.

30. Show importance of memory-cultivation.

31. Quote Hering and Bain on importance of memory.

32. *First* suggestion for memory culture? Explain.

33. Explain relation of blood circulation to memory.

34. What need of observing the laws of hygiene?

35. Give *second* suggestion. Explain.

36. Explain the visualizing principle.

37. Importance of first impressions? Explain.

38. Quote Galton on the subject of first impressions.

39. State *third* suggestion for memory training. Explain the principle.

40. What of order and classification of ideas?

41. Give example of "Betty," the servant girl. What does it show?

42. What is said of *cramming?*
43. *Fourth* suggestion for memory training?
44. Define *attention.*
45. Show importance of attention.
46. Can the mind attend to more than one thing at a time?
47. Quote remark of Isaac Newton.
48. Fact about imbeciles and idiots?
49. Explain the evil of reading or playing mechanically.
50. *Fifth* suggestion for improving the memory? Explain the principle.
51. Give saying of Carpenter and Ribot.
52. Effect of practice?
53. Explain the principle of *interest.* Illustrate.
54. Explain philosophy of illustrations.
55. Value of parables and fables?
56. What of *stories* as an educational agency?
57. Substance of quotation from Nora Archibald Smith.
58. Explain pedagogical value of memorizing music.
59. Further advantage of memorizing music?
60. Show influence of memorizing on *technique.*
61. Influence of memorizing on *musical style?*
62. Explain reference to the tragedian.
63. What does Mertz say about *liberty of performance?*
64. When should memorizing be done?
65. Why should a piece be memorized at the first study.

CHAPTER IX.

Imagination.

IMAGINATION is that power of mind by which we form pictures of things not present. It is the power of representing a mental product as an image. As the name denotes, imagination is the image-making, or image-showing faculty. The Germans call it *Einbildungskraft.* According to Krauth and Fleming, "Vocabulary of Philosophy," "In the language of modern philosophy, the *imagination* seems to denote —first, the power of apprehending or conceiving ideas, simply as they are in themselves, without any view to their reality; secondly, the power of combining into new forms or assemblages, those thoughts, ideas, or notions, which we have derived from experience or from information."

Relation to Memory. Imagination stands in close relation to memory— in fact, depends on memory for its materials. Memory holds and brings back our past experiences just as they were without any modification. Memory is the faculty of unaltered reproduction, while imagination is the faculty of altered reproduction. Memory is the grand storehouse from which imagination draws the materials for its strange creations. "*Memory* retains and recalls the past in the form which it assumed when it was previously before the mind. *Imagination* brings up the past in new shapes and combinations. Both of them are re-

flective of objects; but the one may be compared to the mirror which reflects whatever has been before it, in its proper form and color; the other may be likened to the kaleidoscope which reflects what is before it in an infinite variety of new forms and dispositions."* Or as the poet puts it,

> "Music, when soft voices die,
> Vibrates in the memory;
> Odors, when sweet violets sicken,
> Live within the sense they quicken."
>
> —SHELLEY.

In memory the representation is judged to be of a past experience; in imagination it is not so judged, i. e., the objects of memory are facts of experience; those of imagination may or may not be facts of experience, the question is not considered, the representation is in disregard of experience. "Imagination is productive; memory is merely reproductive. The object represented in memory is real; that represented in imagination may be unreal. Memory is mediate knowledge of the actual in the past; imagination is mediate knowledge of the possible in the past, present or future. Were this power wholly lacking, we should be unable to devise for the future, or to anticipate and provide for even the next coming moment. All hope, all reasonable forecast of events, all inspired prophecy, the history of the future, are wrougnt out by imagination, and then become memories as time flows by."** The following lines of Shelley mark the distinction:

> "You are not here! The quaint witch Memory sees
> In vacant chairs, your absent images,

* McCosh, "Typical Forms," p. 450.

** Davis, "Elements of Psychology," p. 199.

And points where once you sat, and now should be,
But are not.—I demand that if ever we
Shall meet as then we met;—and she replies,
Veiling in awe her second-sighted eyes:
'I know the past alone—but summon home
My sister Hope, she speaks of all to come.'
But I, an old diviner, who know well
Every false verse of that sweet oracle,
Turned to the sad enchantress once again,
And sought a respite from my gentle pain,
In acting every passage o'er and o'er
Of our communion."

—LETTER TO MARIA GISBORNE.

Memory furnishes the materials—paints, canvas etc.—*desire* gives the law or model, and *imagination* paints the picture. Imagination is the power which represents the elements of knowledge in modified forms and in new combinations. Imagination, though differing, as we have just seen, from memory, is not separated from memory by any sharp line of demarcation.

Nature of the Constructive Imagination. While there are several phases of imagination, we shall confine ourselves to the *constructive* or *creative* phase. In what sense is imagination *creative?* It never creates any new materials—all the materials for its workshop are furnished by memory. Its creations are new combinations of old materials; in this way it creates a world of its own and peoples this new world with beings ofttimes strangely unreal, yet always interesting.

In its operations is involved a double process of decomposition and reconstruction, of analysis and synthesis, of dissociation and recombination. *Dissociation* is the antecedent step to imaginative construction. Our concepts of things are formed by

joining together various elements. In the work of the imagination we separate these complex concepts into their elements, and then we proceed to build new combinations out of these elements. As the child pulls its toys to pieces and then out of the fragments makes new toys to please its fancy, so the imagination deals with the concepts held in memory's storehouse.

The creations of the inventor, the poet, the artist, the composer illustrate this process of construction. Look at some of the interesting objects which constitute the treasures of the great world of fancy, and how they are made. From the bust of a maiden and the tail of a fish a *mermaid* is constructed; joining the body of a horse and the head of a man gives rise to a *centaur;* the body of a goat, the head of a lion and the tail of a dragon make up the fabled *chimæra;* the body of a dog, with three heads and with snakes for hair is construed into *cerberus;* the head of a beautiful maiden, the body of a vulture, and the claws of an eagle constitute the *harpies;* adding the wings of an eagle to the body of a horse we have the famous *Pegasus* of the muses and poets, and so on through all the wealth of mythologic fancy. Taking a pile of stones and spreading over it a growing vine, forms in my imagination the picture of the ivy-covered ruins of some old castle. Thus is formed the beautiful imagery of the poets. So Milton made the wonderful creations of *Paradise Lost;* so Shakespeare shaped the "witches" of *Macbeth*, the "Caliban" of the *Tempest*, the fairie figures of *Midsummer Night's Dream;* so Swift constructed the "Lilliputian" people of *Gulliver's Travels;* so Burns made the airy beings

of his *Tam O'Shanter;* so Bunyan formed the characters of his immortal *Pilgrim's Progress.*

The same process of dissociation and recombination is illustrated in the play-fancies of the child, as well as in the superstitious notions of the savage.

The same thing is farther illustrated in the formation of art products. How is a painting made? "The Last Judgment" in the Sistine Chapel at Rome, the "Sistine Madonna" of Raphael in Dresden, the "Paradise" of Tintoretto in the Palace of the Doges, Venice, said to be the largest oil painting in the world with a bewildering multitude of figures, and which Ruskin calls "the most precious thing that Venice possesses"—how are such pictures formed? By combining a few simple elements of colors, shades, perspective, etc., on the background of some historical fact or facts. How were the "Laocoon," the "Apollo Belvedere," the "Dying Gladiator," the "Venus" of Milo formed? These immortal pieces were conceived by the imagination. How was the Cathedral of St. Peter's, of Milan, of Cologne made? If you go to Florence, and, in the house where Michael Angelo lived, view the series of sketches which the master had made of the dome of St. Peter's, you can see how the grand conception of that magnificent structure grew step by step in the imagination of the master architect. How does the landscape gardener proceed in his work? By combining herbs, shrubs, trees, knolls, valleys, rocks, streams, lakes, fountains, avenues, etc., according to a conceived picture of his imagination. So the dramatist constructs his plays; so the musical composer, his melody, his sonata, his symphony, his opera, his oratorio.

Forms and Modes of the Imagination. Several forms of the imaginative faculty must be distinguished. First, we name what may be called the *sense-imagination.* This stands in the functions of sense as the higher modes stand in the functions of intellect and reason. The working of the imagination in the domain of the senses is precisely similar to that of the aesthetic and rational imagination. The phenomena of *phantasy* are to be grouped here, and afford the best illustration of the sense-imagination. The phantasy makes its images severed from the relations of time, place and previous perceptions. The mind acts capriciously, without regard to truth, or reality. The judgment has little to do in the process; the sense dominates everything in the flow of ideas.

Phantasy is the native energy of the soul by which its past experiences are represented as fancies. When we are resting, this mode of soul action manifests itself in the form of reverie; when we are asleep, in the form of dreams. In childhood, fancy makes the stick a horse and the fairy tale a reality. It fills the drunkard's boots with snakes, changes the demented woman into Queen Victoria, and leads the somnambulist to act his dreams. It is also called *involuntary imagination.* As such it is spontaneous, instinctive; actuated by desire without intelligent choice. The phantoms that fright us in the dark, spectral voices that we hear, the odd, ludicrous and absurd ideas that stream through our minds may be mentioned as examples. Dreams are phantasms, involuntary or sense memories—new combinations, "wherein blind phantasy would fain interpret to the mind the painful sensations of distempered sleep." Reverie, castle-building, or day-dreaming is a mild and pleasing form of

phantasy. "The craze of delirium and of monomania are extreme cases. In reverie the imagination suffers but little restraint. Images assemble, form, and dissolve, not so much at will, as at pleasure. In phantasy, the will resigns control, and the disordered sensations, together with appetites and other forms of desire, impelling blindly in the general torpor of intelligence, arouse imagination to unchecked extravagance."

As Milton says,

> "When nature rests,
> Oft in her absence mimic fancy wakes
> Wild work produces oft, and most in dreams,
> Ill matching words and deeds long past or late."

"It is remarkable that the power of self-control seems to have so little reserve force that it is the first of our faculties to break down, not only in our sleep, but in grief, in intoxication, in fever, in case of a stunning blow, etc. Other faculties continue active when this has completely succumbed. The torpor of volition during sleep is an important element in explaining the phenomena of dreaming."*

Imagination proper is purposed and directed effort, but phantasy goes on without purpose and without direction. The former is work, the latter is play. Phantasy is to the imagination what the kaleidoscope is to the designer; it gives suggestions which the imagination may work up in higher forms.

The state known as *day-dreaming* may serve to illustrate. "The body is at ease, the will and judgment are almost *passive*, images come and go at pleasure and are viewed as the figures of a panorama without effort to define, locate, or explain them. In sleep

* Davis, "Elements of Psychology."

when the mind is shut off from communication with the external world and from any correct knowledge of bodily conditions, images alone may be objects of consciousness and may come and go uncontrolled by the judgment."

In soundest sleep and even in delirium we are aware of our dreams and of ourselves as viewing the panorama. The sense-world may fade away, but self never ceases to be conscious of its own acts. While we are aware of our acts, our dreams seem to us to be objective realities. We do not recognize the memories that are woven into our dreams as former experiences, nor are we aware that these fancies are products of our own minds. The ground for this is found in *association* of the materials out of which our fancies are made. In *phantasy* we dissociate our experiences, and then recombine them into new forms. As thus changed we do not recognize them as past experiences, but look upon them as new experiences. Our phantasies are not usually remembered because we have not given them sufficient attention to make perceptible paths in the brain substance.

The phantasy works under certain limitations: (1) We can put into our fancies only our *experiences.* The blind, that is, those born blind, put no color into their fancies. Adults who lost their hearing before the fifth year, it is said, put no sound into their dream images. (2) Phantasy deals only with the concrete, viz., sense-percepts, self-percepts, and necessary percepts. Abstract concepts are not used in our fancies and dreams.

To this may be added that our fancies and dreams depend largely upon ourselves. Our waking life to a great extent determines our dream life. Good diges-

tion, regular habits, physical comfort, an hour or two of bodily and mental rest, and a conscience void of offense are the conditions of sound sleep and pleasant dreams. If our reading, our associations, our thoughts and feelings are habitually pure and elevated, our dreams, our fancies are likely to be peaceful and pleasant.

While our other powers are least active, phantasy is most active. Memory supplies the materials; the laws of association determine the particular course in which the stream of ideas flows. "When *thought* is slightly active, our dreams become arguments. When *imagination* (i. e., in its higher form) is somewhat active, our reveries and dreams become inventions, plans, romances. When our *affections* are slightly active, our dreams become love scenes. When *will* is sufficiently active, we act our dreams. When *memory* is slightly active, we remember our dreams."

In childhood the work of phantasy is particularly marked. The baby weaves its little joys and griefs into its dreams: now it laughs, and now it weeps in its sleep. The play instinct of childhood is a thing of sense and phantasy. Watch the little ones at play, and see how they weave into their plays the things which have come into their experiences. Fairy-land seems reality to the child, and fairy stories give him unbounded pleasure. The incidents of these stories affect children in just the same way as realities affect adults. Saint Nick, too, is reality. We were sorry when we found out that Santa Claus was not reality: long after that we were still fond of hanging up our stockings and placing our caps for Christmas presents. We think it is almost cruel to dispel the sweet delusion. Child literature is based on the activity of

phantasy. The illusions fade out as years advance, but in childhood they served a good purpose.

Physiological Basis of Phantasy. "Sensations, once experienced, modify the nervous organism, so that copies of them arise again in the mind after the original outward stimulus is gone. No mental copy can arise in the mind, of any kind of sensation which has never been directly excited from without."

The blind may dream of sights, the deaf of sounds, for years after they have lost their vision or hearing; but the man *born* deaf can never be made to imagine what sound is like, nor can the man *born* blind ever have a mental vision. In Locke's words, 'The mind can frame unto itself no one new simple idea.' The originals of them all must have been given from without. Phantasy, or imagination, are the names given to the faculty of reproducing copies of originals once felt. The imagination is called 'reproductive' when the copies are literal; 'productive' when elements from different originals are recombined so as to make new wholes.

"*After-images* belong to sensation rather than to imagination; so that the most immediate phenomena of imagination would seem to be those tardier images, which are due to what the Germans call *Sinnesgedächtniss*, — coercive hauntings of the mind by echoes of unusual experiences for hours after the latter have taken place. The phenomena ordinarily ascribed to imagination, however, are those mental pictures of possible sensible experiences, to which the ordinary processes of associative thought give rise." —James.

Prof. Jastrow has ascertained that if blindness occurs before the period embraced between the fifth

and seventh years the visual centers seem to decay, and visual dreams and images are gradually outgrown. If sight is lost after the seventh year, visual imagination seems to survive through life.*

Prof. Joseph Baldwin says: "During repose, when phantasy is most active, the blood-supply to the cerebrum is greatly reduced. Perception and thought and will are slightly active and the exhausted brain recuperates, self drifts. Gentle sensor excitations and present ideas suggest other experiences. Self, without purpose and without plan, goes on linking fancy to fancy. This is scribbling, not writing; this is the child's daubing, not the artist painting. This is the whirlwind piling up the timbers, not the architect constructing the mansion."**

Imagination Proper. We come now to the imagination proper, above and distinct from its sense-connections and sense-complications. Imagination in this sense is purposive and voluntary, fully within the province of will, and proceeding in the light of consciousness. It is the soul's capability to transform the real into the ideal, or to clothe the ideal in the dress of the real. Out of material realities the imagination creates ideals. Out of my experiences, my knowledge and observation of building materials, architectural designs, forms of nature, etc., I create an ideal cottage. Imagination modifies experiences, rearranges them, analyzes them, and makes new wholes. Imagination makes models, constructs hypotheses, forms systems, creates poems. Realities,

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* See article on "Dreams of the Blind," in the New Princeton Review, Jan., '88.

** Baldwin, Psychology Applied to the Art of Teaching."

touched by the magic wand of imagination, become ideals.

Physiological Basis. Imagination, like memory, habit, and association, rests on brain action and is intimately connected with neural processes. In general, we think that all mental activities have their concomitant brain and nerve action. There are many facts drawn from general life and from observations in the psychological laboratory which go to show beyond a doubt that imagination is grounded in physiology. For example, if the inner organ of sight is destroyed, it is impossible to imagine scenes. Ferrier says: "The destruction of the sight centre not only makes the individual blind presentatively, but blind also representatively or ideally, and all cognitions into which visual characters enter in part or whole become mangled and imperfect, or are utterly rooted out of consciousness."*

Every effort of imagination has corresponding to it a molecular movement of the brain substance. Imaged activity tends strongly to go out into real activity; we suit the action to the thought. When we form a mental image of a leap, our muscles are in a state of tension and we are ready to spring; when we go over a speech mentally, we are prone to speak it aloud; when we think of a tune, we are apt to hum it; a feigned blow causes us to start or dodge, etc. Similar to these phenomena are many varieties of involuntary gesticulations and facial expression. Mental stimuli produce brain excitation; so also reciprocally, brain changes as cause may produce mental images as effects. Certain cell movements taking

*Ferrier, "Functions of the Brain."

place in the nerve centers confusedly along lines of preference established by habit, may determine or cause a succession of corresponding mental images in more or less confusion and disorder.

Hence physical appetites, as hunger and thirst, often direct and color our dreams. The man perishing of cold fancies himself wrapped in warm blankets or seated in a comfortable room; a starving man dreams of abundance of food; the wanderer on the desert dying of thirst has visions of flowing streams. Hence, also, the subjective effects of brain fever, and the wildly delightful and extravagant visions of the opium eater.*

Shakespeare says:

> "Lovers and madmen have such seething brains,
> Such shaking phantasies, that apprehend
> More than cool reason ever comprehends."
>
> —"*Midsummer Night's Dream,*" V: Sec. 1.

All these are cases of neural disturbances determining mental images.

Modes of Activity. Several distinct modes of the imagination are to be noted.

First, the Scientific Imagination. This is also called "reflective," "deliberative" (Aristotle), "philosophic," etc. It is especially related to thought in the search for knowledge. "Regardless of sentiment, it seeks neither the beautiful nor the sublime, but driven by desire to know, it labors after truth, which, when ascertained, it strives to represent with clearness and fullness." It is occupied with hypotheses, and seeks to image conceivable possibilities concerning the subject in hand. In the scientific imagination inven-

*De Quincey, "Confessions of an English Opium Eater."

tions and discoveries being. When Hargreaves upset his wife's spinning wheel, his imagination saw in the vertical revolving spindle the ideal of the *spinning-jenny*. In the lifting of the tea-kettle lid, Watt saw the principle of the *steam engine*. In the swinging chandelier of the Cathedral at Pisa, Galileo saw the principle of the *pendulum*, and the world excuses his apparent lack of devotion on that occasion when it remembers the results that have come from that discovery. In the falling apple Newton imaged a world dominated by the *law of gravitation*. In the kite raised into the face of the thunder cloud, Franklin saw a shining highway to the wonder-land of *electricity* and from it received the communication of a truth which has revolutionized modern life.

The scientific imagination affords important aid to the experimenter in science. Before effects are connected with causes the imagination must explore the field and find the possible connection. Imagination is like the scouts that an army sends on ahead to spy out the land, and report a possible route of progress through the unknown country. It also brings its fine clusters of grapes from the brook Eschol to inspire and encourage the halting army of invasion. Imagination marks out the path in which scientific progress should move, and also affords the incentive for progress.

Sir Benjamin Brodie, once president of the Royal Society, said: "Physical investigation, more than anything else besides, helps to teach us the actual value and right use of the imagination—of that wondrous faculty, which, when left to ramble uncontrolled, leads us astray into a wilderness of perplexities and errors, a land of mists and shadows; but which,

properly controlled by experience and reflection, becomes the noblest attribute of man, the source of poetic genius, the instrument of discovery in science, without the aid of which Newton would never have invented fluxions nor Davy have decomposed the earths and alkalies, nor would Columbus have found another continent."

Prof. Tyndall says: "Philosophers may be right in affirming that we cannot transcend experience; but we can at all events carry it a long way from its origin. We can also magnify, diminish, qualify, and combine experiences, so as to render them fit for purposes entirely new. We are gifted with the power of imagination, and by this power we can lighten the darkness which surrounds the world of the senses. There are tories, even in science, who regard imagination as the faculty to be feared and avoided rather than employed. They had observed its action in weak vessels, and were unduly impressed by its disasters. But they might with equal truth point to exploded boilers as an argument against the use of steam. Bounded and conditioned by coöperant reason, imagination becomes the mightiest instrument of the physical discoverers. Newton's passage from a falling apple to a falling moon was, at the outset, a leap of the imagination."

Secondly, the Aesthetic Imagination. This mode of the imagination is also called *artistic.* Its end is not knowledge, as in the scientific imagination, but *beauty.* It singles out elements in nature and in the storehouse of memory, which satisfy the sense of the *beautiful,* and out of this it constructs its ideal complexes. It pays little regard to the *realizable,* because its end

is aesthetic pleasure; if its creations please, what matters it whether they can be realized or not? The aesthetic imagination frames for itself, and lives in, a world of ideal beauty. It is accompanied by lively *emotion*; its forms are more instantaneous and also more inexplicable because they arise from an emotional stimulus. Hence, great artists are generally persons of emotional temperament.

The realm of the aesthetic imagination is the fine arts. All the great works of art from ancient times down to the present have been created by imagination. The masterpieces of painting, sculpture, architecture, poetry, and music are products of aesthetic imagination. The Venus of Milo was first seen by the imagination in the rough block of marble long before the sculptor's chisel released the beautiful angel-form from its sepulchre. The Cathedral at Milan, "that magnificent poem in stone," had its origin in the architect's imagination. The finest poetry is the work of imagination. Hence, the higher degree of artistic imagination is sometimes called the *poetic* imagination. This it is that makes the beauties of literature and peoples the literary world with its strange and interesting figures. It is the orator's powerful instrument, the magic wand with which he sways the thoughts and feelings and passions of his audience at his will. Music is a fairy kingdom in which the aesthetic imagination conceives some of its most charming ideals and displays the wonders of its creative power.

The aesthetic imagination works by the aid of *ideals*. An *ideal* is a mental conception regarded as a standard of perfection, a model of highest excellence. *Ideals* are creations of the mind, as over against *real-*

ities, which exist independent of the mind. An *ideal* is a working model, the harmonious blending into one mental product, of the idea and the object. We fashion our ideals out of the qualities and characteristics which we observe in men and things. In the formation of an ideal of character, for example, the first step consists in studying the lives of illustrious men. The next step is to separate the complex whole into its elements and select the most worthy qualities and combine these into an ideal. These models of beauty and perfection of form, of harmony, of proportion then stand forth as guides in our striving for perfection; our lives then are a series of efforts to realize our ideals. The ideal is ever something yet to be won,—the *possible* waiting to be made *real* in effort,—the *latent* waiting to be revealed in action,—the *prophetic* waiting to be fulfilled in earnest endeavors for the attainment of the highest good.

These ideals are formed, not capriciously, but according to the principles of reason. The reason has its *pure forms*, and the making of ideals is but the filling in of these pure forms by means of concrete materials gathered by experience and held by the memory. Knowing the place which our ideals occupy in our lives, we can judge the importance of having the highest and best ideals. This is what Emerson meant by the startling expression, "Hitch your wagon to a star." "As a man thinketh in his heart, so is he"—i. e., as our *ideals*, so are we, for these are ever striving to realize themselves in our outward life, and so most profoundly shape our character.

The Limits of Imagination. The imagination creates its world of beauty within certain limits. The first and most important is that of *experience*. Although

in one sense it disregards experience, yet, on the other hand, it cannot transcend experience. Imagination must depend on memory. In its highest power, in its utmost flights, its images are but combinations of partial experiences given by memory; it creates no new materials, it is only the particular combination that is new. Says one, "Experience is the quarry whence memory draws the materials with which imagination (Einbildungskraft) builds."

"All presentations, external and internal, all sensations, emotions, desires, affections, volitions, and thoughts furnish, through memory, materials for imagination. Whatever can be remembered can be idealized." It follows from this that our ideal world will be fashioned according to our actual sense-world and thought-world. The elements in which we live will determine the forms of our imaginary creations. Since the greater part of our sense-life is occupied with visual objects, our ideal world is filled predominantly with visual images, i. e., of things seen. Auditory images, though numerous, are yet far less common than visual images.

Our imaginary creations are but the reflex of our personal experience. If we live in a low and sensual sphere our imaginations will be of a kind to correspond. To the Indian, heaven is a happy hunting ground, where game never fails, and where he shall again have his faithful dog, his bows and arrows, and his wampum. To him the Indian summer haze is the smoke from the Great Spirit's peace-pipe.

This principle has important application to the music student. What shall be the character of your musical ideals? That will depend upon your musical experience,—the kind of music you hear and play, the

musical atmosphere in which you live, the companions you associate with daily. If you live in a low musical sphere your musical ideals will be low. Strive to set up and maintain a high standard. Cultivate acquaintance with the masters. Avoid the trashy and showy kind. Musical culture consists in knowing and associating with *the best*. The brilliant is of low value and in the end serves only to display self. It is in music as in dress, the flashy and showy is always a mark of uncultivated taste. Be sure you have your experience with deep and true music. As we get better acquainted with it, we find it more and more interesting, it always has something new to say to us. We go to it again and again, and we always get new meanings, which inspire and elevate our thoughts. As our acquaintance grows and our taste improves, the truly classic music yields new beauties.

The principle we are urging has important educational consequences. Remember our ideals depend on our experience. As the stock of our ideas, so will be our imaginary creations. Here also it is true that the stream does not rise higher than its source.

The imagination is further limited to the *individual* and the *concrete*. We form no images of the general and abstract. The object immediately present to the imagination is an *individual*. Then, too, our imaginary creations must conform to rational principles. Those general principles of mind which condition thought in all departments are equally operative in the working of the imagination. For example, we cannot imagine a body not contained in space and yet occupying space, nor an effect without a cause, nor that a thing can be and not be at the same time, etc. Imagination cannot go beyond the necessary

principles which govern all the thinking processes of the reason.

The Influence and Importance of Imagination. The imagination has wonderful power both over mind and body, in society and the state, in morals and religion, in general life. "Imagination," said Napoleon, "rules the world." And Prof. Baldwin says: "Imagination is a master power, commanding all our other capabilities. Memory, from our stores of experiences, supplies imagination with materials. Will contributes purpose and concentrated and sustained effort. Emotion gives wings to imagination. Thought contributes discretion and law. Imagination is the master-builder, and our other powers are the coöperating workmen."

First, Its Mental and Bodily Effects. Facts of common experience and observation furnish many instructive examples. The witchcraft craze, belief in pow-wowing, magnetic healing, Christian science, patent medicines, charms, hypochondriasis, and all the superstitions of life are so many instances of the power of imagination. Certain special cases are particularly interesting. Halleck gives the following:

A fussy man at breakfast would insist that the cream for his gruel was sour, made much trouble in sending out for a fresh supply. Finally, his wife told the servant to keep some of the same cream outside, and to bring that in whenever there were complaints —the new supply always seemed much better.

Prof. Bennett, of Edinburgh University, mentions a case reported to him by the chemist who had witnessed it. A butcher, working in the market of Edinburgh, was in the act of hanging a heavy piece of meat on a sharp hook, when his foot slipped and he

was caught by the arm and hung suspended in the greatest anguish. He was taken down and carried across to a chemist's shop, where the case was at once attended to as one of urgency. The surgeon proceeded to cut open the sleeve of the man's coat, the sufferer crying out in great agony as this was done; yet, when the arm was exposed, it was found that the skin had not even been scratched.

Dr. Noble records a similar case in the experience of M. Boutibonne, a literary man, who served in Napoleon's army, and was engaged at the battle of Wagram, which resulted in a treaty of peace with Austria in November, 1809. Towards sunset, when reloading his musket, he was shot down by a cannon ball. He felt as if the greater part of both legs had been carried away and all night he lay helpless, not daring to move, lest he should bleed to death. At early dawn a medical officer came to his help. To the question, "What's the matter, my comrade?" M. Boutibonne replied, "Oh, touch me gently, I beseech you; a cannon ball has carried away my legs!" The doctor examined his legs, and with a laugh, bade him get up as there was nothing wrong, when the sufferer leaped to his feet in amazement. The cannon ball had carried away the ground underneath his feet, and he had fallen into a trench which had been suddenly opened.*

A man sentenced to bleed to death, was blindfolded; a harmless incision was then made in his arm and tepid water fixed so as to run down the arm and drop with considerable noise into a basin. The attendants frequently commented on the flow of blood and the

*Tuke, "Influence of Mind upon the Body."

weakening pulse. The criminal's false idea of what was taking place was as powerful in its effects as the reality and he soon died.

"A person imagining that he is suffering from disease of the heart, and frequently directing his attention to the movement of that organ, may produce disease where originally there was none; and, in like manner, we are told that "the idea that a structural defect will certainly be removed by a certain act increases the organic action of the part, and sometimes produces a cure."—Dr. J. Müller.

These phenomena are explicable on physiological principles. Imagination fixes the attention, and the attention strongly directed to any part or organ of the body may produce congestion or disease in the organ.

"When the attention is directed to any part of the body, innervation and circulation are excited locally, and the functional activity of that portion developed. This is well known in the common forms of hypochondriasis, in which the patient being morbidly anxious as to the state of some particular organ—e. g., the heart—constantly directs his attention to it, and thus functional disorder, and even structural disease, are caused."—Dr Laycock.

"There can be no doubt that real disease often supervenes upon fancied ailment, especially through the indulgence of what is known as the hypochondriacal tendency to dwell upon uneasy sensations; these sensations being themselves in many instances purely subjective."—Dr. Carpenter.

Mr. Carter (On the Pathology and Treatment of Hysteria) relates the case of "a lady who, watching her little child at play, saw a heavy window-sash fall

upon its hand, cutting off three of the fingers; and she was so overcome by fright and distress as to be unable to render it any assistance. A surgeon was speedily obtained, who, having dressed the wounds, turned himself to the mother, whom he found seated, moaning and complaining of pain in her hand. On examination, three fingers, corresponding to those injured in the child, were discovered to be swollen and inflamed, although they had ailed nothing prior to the accident. In four and twenty hours incisions were made into them and pus was evacuated; sloughs were afterwards discharged, and the wounds ultimately healed."*

Secondly, Its Effects in Practical Life. Imagination is a grand motive power in human progress. All progress comes from efforts to realize ideals, and ideals are our approaches to the perfect. Without lofty and inspiring ideals, there will be little progress in any department of human interest. Because the soul is progressive, it never quite repeats itself, but in every act attempts the production of a new and fairer world. This is what makes life so interesting; without it, the humdrum reality of life would be well nigh unbearable. In practical life, in art, in literature, imagination insures originality and progress. The leaders of thought and action, in all ages, have been persons gifted with powerful imaginations.

A cultivated imagination leads the way in high achievements. The reason for this is apparent. Where there are high ideals there will be corresponding deeds, but it is the office of imagination to make our ideals. Our ideals of perfect manhood lead us

*Carpenter, "Human Physiology."

forward and upward in our efforts at character-building. Imagination stimulates mental energy. By its aid we can do more and better work, besides robbing hard work of its tedium. Being a constant inspiration to effort, it leads the way to progress.

At the bottom of all progress is the quickening influence of imagination on the mind. "Imagination gives vividness to our conceptions, imparts tone to our entire mental activity, adds force to our reasoning, casts the light of fancy over the somber, plodding steps of judgment, gilds the recollections of the past and the anticipations of the future with a coloring far transcending the dull actualities of life. It lights up the whole horizon of thought, as the sunrise flashes along the mountain top and lights up the valleys of earth. Not alone the poet, the orator, the artist, derive benefit from the use of the imaginative faculty, but it is of inestimable value to all men. It opens for us new worlds, enlarges the sphere of our mental vision, releases us from the bonds and bounds of the actual, and gives us, as a bird let loose, the wide firmament of thought for our domain. It gilds the bald, sullen actualities, and stern realities of life, as the morning reddens the chill, snowy summits of the Alps, till they glow in resplendent beauty" (Haven).

Perhaps no faculty of the mind is of more practical value than imagination when properly cultivated and held in due restraint. Especially is it of value in forming and holding before the mind an ideal of excellence in whatever we pursue, a standard of attainment, practicable and desirable, but loftier far than anything we have yet reached. To present such an ideal is the work of imagination, which looks not up-

on the actual, but the possible, and conceives that which is more perfect than the human eye hath seen, or the human hand wrought. No man ever yet attained excellence in any art or profession, who had not floating before his mind by day and by night, such an ideal and vision of what he might and ought to be and do. It hovers before him and hangs over him like the bow of promise and of hope, advancing with his progress, ever rising as he rises, and moving onward as he moves; he will never reach it, but without it he could never be what he is.

"The happiness and misery of every individual of mankind depends almost exclusively on the particular character of his habitual associations, and the relative kind and intensity of his imagination. It is much less what we actually are, and what we actually possess, than what we imagine ourselves to be and have, that is decisive of our existence and fortune" (Hamilton).

"Imagination, by the attractive or repulsive pictures with which, according to our habits or associations, it fills the frame of our life, lends to reality a magical charm, or despoils it of all its pleasantness. The imaginary happy and the imaginary miserable are common in the world, but their happiness and misery are not the less real; everything depends on the mode in which they feel and estimate their condition . . . At a distance things seem to us radiant with a celestial beauty, or in the lurid aspect of deformity. In the past our joys reappear as purer and more brilliant than they had been actually experienced; and sorrow loses not only its bitterness, but is changed even into a source of pleasing recollection."

Hence, the fair picture of a '*Golden Age*', the dream

of the youth of mankind. "Man never is, but always to be, blessed."

In old age, when the future is dark and short, imagination carries us back again into the midst of days that were far better than the present;—our happy past is brought back, tinted with colors more brilliant than any we ever experienced. "The young," says Aristotle, "live forwards in hope, the old live backwards in memory."

> "Tis distance lends enchantment to the view
> And robes the mountain in its azure hue."
>
> *Pleasures of Hope.*

Imagination lightens the burdens of life. Dr. Hewett says: "A little boy, walking with his grandfather, complained of being tired, and asked his grandfather to carry him. 'No,' said the grandfather, 'take my gold-headed cane and make a horse of it.' The boy bestrode the cane, and galloped away happy."

Many a weary man at his daily toil finds his task less heavy when imagination points to the comforts which that toil may bring to wife and child. Many a poor, tired mother, as, late at night, she repairs the tattered clothing of her little ones, may find the task sweetened as she pictures the possible future of those objects of her care and toil. The teacher way well imagine what her troublesome little ones may become. Almost every cloud has its "silver lining," but imagination must find it. Oh, the happy faculty that weaves into life's sombre fabric some threads of gold and silver, that illumines the dark picture of daily experience with some bright colors!

In the language of another, "The more closely we study human knowledge and thought, the more

clearly do we perceive that this word 'imagination' has more compass and depth of meaning than any other word which we apply to our faculties. Wherever and whenever life becomes great and the world real to us, the imagination holds aloft its quenchless torch.

In every hour when a new truth moves back a little the horizon of thought, or a new birth of beauty expands a little the world of art, the imagination is present . . . It is to the imagination alone that second sight belongs,—that sight which does not rest in obvious and material things, but through them, as through an open window, perceives another and diviner order of creation. Thus the imagination fulfils for the soul the double function of seeing and interpreting, of discovering and possessing."

Fourthly, Its Influence in Music. Art in general is the kingdom of the imagination, This is true both in respect to the creation of art-works, and also the appreciation of art-products. How rich and wonderful are not the creations of imagination as we see them displayed in the world's great galleries! What a kingdom here! So in the temple of literary fame, how rich, how vast, how beautiful, how inspiring the empire of poetic imagery! But music surpasses all other departments of art in the wealth and magnificence of its imaginative creations. As music students, we are especially interested in the use of imagination, not only in the composition of musical masterpieces, but also in the appreciation and interpretation of them.

A lively and well cultivated imagination is of inestimable value to the musician in calling forth those ideal chords, those sublime harmonies in the soul

which are the true content of all good music and which constitute its indescribable charm.

Imagination is to the musical artist what the sails are to the ship, namely, a propelling power. Wagner once said that a "composer, when at work, is in a state of clairvoyance." What does this mean? *Clairvoyance* means *clear vision*,—clearer than the sense can yield, a vision transcending the power of the natural eye,—a power attributed to some persons while in a mesmeric state, of discerning objects not perceptible by the senses in their normal state. The clairvoyant power of the musical composer is but another name for his imagination. When his senses fail him, his imagination comes to his aid and opens up to him the beauties of the soul's secret wonder-realm, its fairy-land of "vision beatific."

What Wagner thus said of the composer is also applicable, in a less degree, to the *player* and the *singer*. His imagination transports him beyond himself, so that he is in *ecstasy*. Ecstasy (*ex*, out of, and *sto*, stand) means to be outside of one's self, or beside one's self; as Festus said, "Paul, thou art beside thyself; much learning doth make thee mad." When a player or singer does his best, he is *rapt* (from *rapio*, to seize and carry off, to snatch), carried out of himself, snatched away, enraptured, transported with love, admiration, and delight,—wholly absorbed or engrossed in his performance. Hence, Longfellow's phrase, "the *rapt* musician,"—snatched away as by some invisible power and transported into a third heaven, where he hears sounds unutterable, harmonies transcending the powers of expression. It is his imagination that secures for him access into this wonderful sound-realm. It is this that gives his playing and

singing *inspiration*. The musician's whole self is concentrated in what he does, so that the world outside of himself fades away from his view and he communes face to face with the beautiful forms which animate his vision.

By this means the player brings himself into sympathy with the composer and with the occasion. A distinguished musician and author in the following extracts tells us a valuable secret:—

"When I am about to perform music, I endeavor to concentrate my whole self on what I am to play. If I am to play a funeral march, I first strive to enter the house of mourning. There I see the dead one lying in his coffin, I see the floral offerings, and methinks I can smell the very tuberoses. I see before me the family of the deceased, with pain and sorrow depicted upon their faces, yes, I hear from time to time the moans and sobs which irresistibly escape their lips, breaking the monotonous and painful silence that pervades the death chamber. I hear the word of God read, I listen to the hymn of consolation, I see them close the coffin after the family have taken the last, sad glance. I see them carry the body out, I hear the creak of the hearse door, and a cold chill runs over me, as, in my imagination, I hear the terrible noise produced by placing the coffin within; I see the people standing on the pavement looking at each other with sorrowing faces, I hear the bell toll, I see the procession start, and thus I prepare myself to play a funeral march."

"When I hear that tender Aria from the Messiah, 'He was despised and rejected,' I see my Saviour's suffering face as he stands before Pilate, or as he is spat upon, mocked and struck by the rude hands of soldiers. I see his forehead bleeding from the thorny crown, matting his hair, and staining his lovely face. A voice says, 'Ecce Homo!' The Master's loving eyes look at me, and when I play the accompaniment, where the instrument moans and sobs, as it were, I often shed tears at the sorrowful sight before me. Then, when the song is ended, I feel a sense of contrition and sorrow, I hardly dare to speak aloud, I see my own waywardness that has brought all this suffering of sorrow and grief on this man. Oh, what a power there is in such a song, how it lifts us up and brings us nearer to God!"

"Händel said, that when he wrote the Hallelujah chorus, he thought he saw the heavens open, and the angels singing around the throne. So when I hear this strain, I stand on Calvary and I look up at the cross, and confess my own guilt, my lack of love."

"When I hear a strain from the immortal Beethoven, I wander to the master's home, I hear him complain of the hardness of this world, I hear him bemoan his deafness, I see him as a caged lion shut out from the world, and sadly I sit down by his side, and with fear and awe I listen to what he has to tell me. When I hear some of his strains, I imagine him to be a Jupiter; then again his strains impress me as would the appearance of the ghost in Hamlet. Suffice it to say, my imagination is never idle when playing this master's wonderful strains."

"When I play one of Mendelssohn's Venetian Gondola Songs my mind goes to sunny Italy, and in my imagination I see Venice with her streets of water and her beautiful blue sky. I hear the music of the boatmen, and whether my fancy picture is correct or not it serves my purpose, it enables me to play and enjoy the little tone poem to a higher degree. Listen to it, hear its passionate yet tender melody, and notice how, as the boat has passed away in the distance and the song is no longer heard, there is a spell left behind that holds you as in a dream; and after the little strain is ended, I sometimes sit spell bound and listen, as if I could still hear the gentle strain that has vanished so softly."

"I have a little slumber song which I love dearly. Before I play it I often go to a quiet country home. There on the rustic old porch, the mother has seated herself with her needlework; by her side stands a cradle wherein lies her little treasure, about to take its afternoon nap. Oh, I can fairly feel the stillness of the day; I see the glorious sunlight as it falls on the thick vines which surround the porch, letting in enough light to throw the strangest and most artistic forms of shadow on the floor and wall. I hear the hum of the insects, I hear the distant voice of the ploughman, I hear the tinkle of the cow bell, and while the mother rocks the cradle she sings this little air, called the slumber song. Listen to the accompaniment with its rock ing, and then hear that sweet melody as it finally dies away when the baby is asleep."*

*Mertz, "Music and Culture."

From these examples we see that the true musician, when singing or playing, is, so to speak, out of the body; he roams in a land of fancy.

It is not possible to sing or play with expression without the aid of a well trained imagination. Thought and sentiment are indeed necessary on on the part of the musician for proper expression, but these must be supplemented by a lively imagination, the power which enables him to live himself in the situations and conditions so that he becomes oblivious to the outer world.

The power of imagination in music may be judged from certain innocent deceptions which are often practiced on people. A musically inclined lady in London once went to one of Paganini's rehearsals. Having failed to bring his instrument along he borrowed one from a member of the orchestra, and, instead of playing, made merely a sort of pizzicato, indicating the time in which he would play the piece. After the rehearsal the lady addressed Mr. Cook, the leader of the orchestra, saying, "Oh, dear Mr. Cook, what a wonderful man this Paganini is; I declare that until this morning I absolutely knew nothing about music, I never knew what it is capable of." "Indeed," said Mr. Cook, "music is a great art, but allow me to say that you are indebted to your imagination for this pleasure." "How is this, Mr Cook?" "Why, Paganini did not play at all, he did not touch a bow." "Extraordinary," replied she, "I am more than ever confirmed in my opinion of him, for if without playing he can affect people in this manner, how much more wonderful must be the sensation when he does play."

Violin players in diminuendo terminations sometimes practice deception on their audience. After

the pianissimo has been reached they continue to bow as if still playing, but they are careful not to touch the strings. The listener hears in imagination a still fainter sound than the pianissimo.

Liszt on one occasion found himself surrounded by a bevy of ladies who importuned him to play for them, to produce for them "those ecstasies, those artistic raptures which his magnificent talent never failed to evoke." Overcome by their persuasions, he seated himself at the piano and played. By his wonderful skill some of the ladies were soon overcome with delight; some even fainted! In telling a friend of the matter afterwards, Liszt said: "Believe me, I played many wrong notes intentionally; indeed, so palpable were some of my errors, that had I been playing at any elementary music school, I should certainly have been expelled as an impostor."*

Musical Interpretation. A vivid imagination is highly necessary for musical interpretation. What is interpretation, and what is implied? It means to explain, to tell the meaning of, to expound, to translate orally into intelligible or familiar terms, to show by illustrative representation, as an actor, e. g., interprets the character of Hamlet, as a musician interprets a sonata, as an artist interprets a landscape.

Musical interpretation implies a hidden meaning in the composition, else there would be no need of interpretation. What has no deep meaning needs no interpretation; a dime novel does not need to be interpreted. Shakespeare's plays need interpretation; so do "Paradise Lost" and Beethoven's Symphonies. Classic music needs to be interpreted, because there is always something new, something fresh about it

*Gates, "Anecdotes of Great Musicians."

every time we look earnestly into it. The sonatas of Mozart, Haydn, Beethoven, and others afford opportunity for interpretation. It is the office of the musical interpreter to represent in tone and action the meaning of the composer, to *reproduce* the beautiful imagery which occupied the mind of the composer at the time he wrote the piece.

Take for example the dramatic actor. What is his office? In what does his art consist? It is to represent to the audience by means of words, gestures, acts, etc., the imagery and scenes of the play just as the writer of it saw them or conceived them. The great Shakespeare actors and actresses have been profound and patient students of Shakespeare's plays. Thus alone can they find out the meaning of the plays. But this in itself does not make them good actors; they need a vivid imagination to represent, first, to their own mind, and, secondly, to the audience, the meaning of the play. So also is it in the matter of musical representation. The player or singer must have the power to image to his own mind the meaning of the composition, and then to represent the same to the listeners. From a thorough study of the nature and meaning of a work, the interpreter must form a correct mind-picture of it. In this way he will be able to grasp the meaning of the work as a whole and represent it in life-like form. His imagination is the power that will bring the work before the mind's eye as a piece of musical sculpture or architecture.

Enjoyment of Music. It is in music as in poetry. The works of Milton, for example, can not be comprehended, or enjoyed unless the mind of the reader cooperates with that of the writer. Milton does not paint a finished picture,—he sketches it, and leaves

others to fill up the outline. So the great musician does not play for a mere passive listener: he strikes the key note, so to speak, and then expects his hearer to make out the melody. In order to enjoy Spenser's *Faerie Queen* the reader must abandon himself to the luxuriant fancy of the poet, and with him float along through the varied scenes of his enchanting fairyworld in blissful oblivion of the realities of the senses. So, to enjoy the rare beauties of Mozart and Haydn the listener must rise on the wings of imagination into ethereal heights and view those heavenly visions which occupied the minds of the composers, all forgetful of the outer world.

Schubert's music has a high degree of imaginary coloring: there is very much of the spirit of poetry in it. It is said of Dr. Johnson that when he got hold of a book "he tore the heart out of it;" with Schubert it was very much the same way. When he read a poem, he at once fastened upon it and transcribed it in music. Schumann said of him, "Everything that he touched turned into music." Liszt said of him, "that he was the most poetical of musicians." By his magic touch some of the finest poems of our greatest poets were enhanced and even surpassed when translated into musical language. He possessed in preeminent degree what Wagner has called "*musical clairvoyance*," which is but another name for image-vision. In listening to Schubert's compositions it is often as if one were brought into face to face contact with music itself; it is as if in his pieces the stream from the great heavenly reservoirs were dashing over us, or flowing through us. Owing to these peculiarities, his music can best be enjoyed when the listener or player is in a similarly high

wrought state of mind,—*rhapsodical* state. Many of Schubert's symphonies and other instrumental pieces are of a peculiar, wild, weird, romantic beauty, best described as "*Schubertian.*" Schubert is among musicians what Hawthorne is among story writers, a *delightful romancer,* and to enjoy his rhapsodical music one must let his imagination have loose reins to wander at pleasure over moor and fen, through field and forest, over mountain and valley wherever the weird fancy of the author may lead.

Cultivation of the Imagination. If the imagination has such power and influence, as we have now seen, the importance of carefully cultivating it immediately follows. The need of cultivating the imagination arises from the nature of its action, viz., a tendency to disregard truth in its creations, and to become wild and romantic in its operation. In all these respects there is a tendency towards injurious excess. If a youth learns to satisfy himself with his imaginative indulgences, he becomes unfit for the serious work and duties of life. Excessive use of the imagination destroys the power of decision and action by weakening the will. For will and judgment as regulative principles of life, it substitutes emotion, and the life which is governed by emotion is apt to swing off into all kinds of extremes. So in order to keep the intellectual life in its normal balance, and secure for the imagination its proper place and value in the mental economy, it must be subjected to restraints and wholesome discipline.

The fact that the maximum activity of the imagination occurs during the formative period of life, when all other powers must be subjected to training in order to secure them their normal development,

makes it necessary also to cultivate the imagination during this period. Herbert Spencer says: "There is a certain sequence in which the faculties spontaneously develop, and a certain kind of knowledge which each power requires during its several stages of growth. It is for us to ascertain this sequence and supply this knowledge."

This is an educational principle of great importance. If a faculty is capable of culture, very manifestly the psychological foundations of education demand that the time for such culture be the period of growth.

When is this period of growth? In childhood phantasy is very active, but the higher imagination only moderately so. Infants possess what we have called sense-imagination, but little if any of the higher modes of imagination. In youth this faculty becomes marvelously active, but its products are crude. About the age of fourteen it bursts forth into wonderful activity, and becomes more and more vigorous as the years go by. In manhood, about the age of twenty-one, imagination attains its full activity. From this time till after the middle of life it continues its sway.

According to the educational principle above laid down, namely, that the time for training a faculty must be the period of its growth, the right time for cultivating the imagination is between the ages of twelve and twenty-one. This is also the period when our *ideals* are shaped.

Means and Methods of Cultivation. Even imagination conforms to law, and consequently educational laws are applicable to the training of it. Well directed effort under the guidance of judgment and will occupies the first place among the culturing means. Proper *use* improves the creative faculty, while *neglect*

weakens it. The unimaginative must put forth effort to picture things; the over-imaginative must restrain their excessive fancy. Studies and exercises which have the effect, either to stimulate or to restrain as the case may require, have high disciplinary value. Among these, *music* ranks foremost. The effort to picture in one's mind the composer's conception as a whole, so that his tone concepts may stand forth in vivid, almost visual outline, has the effect to greatly strengthen and develop the picturing faculty. Effort to create musical ideals educates the musical imagination. Hence, it is a good thing to encourage the pupil to compose. Where this is not practicable, it is an excellent practice for the pupil to try to reproduce in his mind the *ideals* of composers as embodied in their compositions.

Kindergarten methods are to be encouraged. They embody the best philosophy of education in general. The imagination is cultivated by easy objective work. By the kindergarten method the child is led to make new combinations of blocks, sticks, lines, etc,,—new forms in paper, wood, clay, etc.,—new arrangements in stories, plays, pictures, etc., in all of which his power of imagination is called forth. Many of the principles involved in these methods, though designed for children, are just as applicable to adults. The great thing in this kind of training work is to cause the learner to *originate new combinations according to ideals which are his own,* whether with blocks, sticks, lines, notes, or whatever else.

The pupil should try to *image* what he reads or studies. It is not enough to read the notes as they stand on the staff; you should associate with them some image of vision or sound. The imaging habit

is essential in learning to read well any ordinary book. A reader will be able to express adequately the sense of what he reads in proportion as he can make the sense stand forth in clear and distinct images. For instance, take the sentence, "See the pretty snowflakes falling from the sky." It is apparently very simple and easy to read; but no one is able to read it well, i. e., *appreciatingly* or *realizingly*, until he can image correctly the falling snowflakes. Suppose you are teaching a class to read this sentence. It will help the imaging process if you draw a picture of a snowflake; then cut out of white paper a number of snowflakes. "Who can make a snowstorm?" you ask. Taking a handful of the paper-flakes, hurl them into the air, and you awaken in the minds of the pupils an image of the falling snowflakes. The music teacher can devise similar means for cultivating in his pupils the habit of *imaging* what they play or sing.

The study of *onomatopoetic* words and phrases has excellent value in training the imaginative faculty. Onomatopoetic words are such as imitate in their sound the sense they convey, e. g., "buzz, "hiss," "crackle," "bang," "splash," "thud," "roar," "rumble," etc. The verses of Milton abound in examples. The following stanza from Saxe's "Rhyme of the Rail" illustrates the point:

> "Singing through the forests,
> Rattling over ridges,
> Shooting under arches,
> Rumbling over bridges,
> Whizzing through the mountains,
> Buzzing o'er the vale—
> Bless me! this is pleasant,
> Riding on the rail!"

Or take some lines from Southey's "Cataract of Lodore"—

"Dividing and gliding and sliding,
And falling and brawling and sprawling,
And driving and riving and striving,
And sprinkling and twinkling and wrinkling,
And sounding and bounding and rounding;
And grumbling and rumbling and tumbling,
Delaying and straying and playing and spraying,
Advancing and prancing and glancing and dancing,
And thumping and plumping and bumping and jumping,
And dashing and flashing and splashing and clashing;
And so never ending, but always descending,
Sounds and motions forever are blending,
All at once and all o'er, with a mighty uproar—
And this way the water comes down at Lodore."

The study of *descriptive music* is good exercise for the imagination. Schumann's picture-music affords excellent specimens. Mr. Derthick has said, "There is no book of fairy tales in all the world that has in it so many beautiful stories and pictures as you will find in the two books of Schumann, called 'Scenes of Childhood' and 'The Album of Youth'." This "picture music" or "program music," as it is sometimes called, is intended to convey to the hearer, by means of instruments and without the use of words, a description or suggestion of definite objects, scenes and events, which of course can be apprehended only by the aid of the imagination.

Study the *beautiful* in nature and art. Beauty marvelously quickens the imagination. Commune with nature; study her forms, her colors, her sounds, her motions. Oh, the beautiful world we live in! Cultivate an appreciation of *art* from the standpoint of the artist. In the products of art see the artist's

ideals; he created the ideals which he has embodied in his pieces; creating them over again on the part of the pupil educates his imaginative powers. Still more does it cultivate his imagination if the pupil tries to create original art-ideals and strives to realize them. Cultivate a correct art-taste. There is prevalent in the word, unfortunately, much very bad taste. There is a tendency to extravagance and show. We see it in the excessive foliage of vegetation allowed to run wild, in dress, in the architecture and decoration of our houses, in the style of living, in music. Extravagance belongs to the inexperience of childhood, the crudities of the savage, the Philistinism of the half educated. Acquire a thorough knowledge of aesthetic principles and the principles of art criticism.

Add to the *stock of concepts.* The imagination must have an abundance of materials out of which to shape its creations. Just as a child must have sufficient nutritious food for the proper growth of its body, so the imagination must be supplied with concepts in order that it may attain its right development. Therefore, extend the field of knowledge, multiply points of contact with the great world of thought and achievement, read the best poetry, history and science, cultivate familiarity with what is grand and lofty and inspiring in letters, art, oratory, music. No one can be familiar with the creations of Shakespeare and Milton, Mozart and Beethoven, Raphael and Michael Angelo without catching something of their inspiration.

It is the business of imagination to seek out pictures and materials for pictures in the realm of the real in order to construct and adorn the realm of the ideal. If a child has only few and poor blocks his

constructions are limited; if he has many blocks, he will build his temples and castles and cities on a grander scale. So the first requisite to a fine creative imagination is a sufficient supply of preceptional and conceptional materials. If you possess only few accurate ideas, you need not wonder why you have no greater imaginative power. Imagination builds on the suggestions of experience. And it does not require unusual, rare, out-of-the-way, materials to make a fine imagination. Suitable materials are found in the life of every person. Just look around you and note the great wealth of materials for fine fancy sketches. Autumn leaves with their glorious coloring, waving grain fields, lights and shadows over forest and moor, meadows adorned with clover and daisies, blooming orchards over against the blue summer sky, the singing birds, the babbling brooks, the glowing sunset, the fantastic silver edges of the thunder cloud, the brilliant bow of promise, the drapery of mist skirting the mountain side, the brilliant stars, the flush of morn, the sighing breezes, the roaring tempest, the hum of machinery, the buzzing of bees, the sports of the insect world, the herds and flocks of the field and barnyard, the "human face divine," busy life in all its phases—these and ten thousand other things are strewn about the pathway of everyone and afford rich materials for the beautiful creations of an active imagination.

QUESTIONS.

1. Define *imagination.*
2. Describe the relation of imagination to memory.
3. Point in the lines from Shelley?
4. What is meant by the *constructive imagination?*
5. Describe double process of *decomposition* and *reconstruction.*
6. Illustrate the creative process of imagination.
7. What is meant by *sense-imagination?*
8. What is *phantasy?* Illustrate.
9. What of *day-dreaming?*
10. What is said of *sleep* and *delirium?*
11. How does phantasy depend on *experience?*
12. What of phantasy in *childhood?* Illustrate.
13. Describe the physiological basis of phantasy.
14. What about *visual* dreams in case of blindness?
15. Describe the general nature of *imagination* proper.
16. Explain its *physiological basis.*
17. Describe the *scientific mode* of imagination. Give examples.
18. Value of imagination to the *experimenter* and *inventor?*
19. Substance of remarks by Brodie and Tyndall?
20. What is the *aesthetic* imagination?
21. What are *ideals,* and what their *value?*
22. What of *experience* as a *limit* of imagination? Explain and illustrate.
23. Educational bearing of this principle?
24. Show that imagination is limited to the *individual* and the *concrete.*
25. What of the general *influence* and *importance* of imagination.
26. Describe its *mental* and *bodily effects.* Illustrate.
27. How explain these phenomena?
28. Give substance of statements by Laycock and Carpenter.
29. Effects of imagination in *practical life?* Explain.
30. Its influence on *human happiness?* Illustrate.
31. Its influence in old age?
32. Influence on the hardships and trials of daily life?
33. Describe the beneficent function of imagination.
34. Influence of imagination in *music?*
35. How is a good imagination of value to the *musician?*

36. Explain Wagner's expression about *clairvoyance*.
37. What is *ecstasy?* Illustrate.
38. What is "the *rapt* musician"?
39. Give substance of extracts from Mertz. What do they illustrate?
40. Why is imagination necessary for good *singing* and *playing?*
41. What is said of *certain deceptions* perpetrated by musicians? Illustrate.
42. What is *interpretation*, and in what cases necessary? Illustrate.
43. What *value* has the imagination in *musical interpretation?*
44. Why is imagination necessary for the *enjoyment* of music? Illustrate.
45. What is said of Schubert and his music?
46. Why should the imagination be cultivated? To what extent possible?
47. *When* should the cultivation take place, and why?
48. State Spencer's dictum, and show its importance.
49. When is the *period of growth* of the imaginative faculty?
50. What general remarks about *means* and *methods* of cultivation?
51. What about *Kindergarten* methods?
52. Value of the *imagining* habit in reading music? Illustrate.
53. What of *onomatopoetic* words? Give examples.
54. Benefit of studying *descriptive music?*
55. What of Schumann's *picture-music?*
56. Why study the *beautiful* in nature and art?
57. Explain value of concepts in the culture of the imagination.
58. What of *beauty* in the world?

CHAPTER X.

The Feelings and Emotions.

THE feelings constitute one of the three grand divisions of psychology. Perceptions and conceptions are accompanied by certain states of mind, such as anger, fear, hate, love, joy, grief, shame, pride, avarice, revenge, humility, etc., etc. These are broadly called feelings or emotions. *Feeling* as a state of the soul is distinguished, on the one hand, from *sensation*, which is a state of the body, and on the other hand, from *emotion*, which is more complex and denotes a subdivision of feeling. Emotion is often used as synonymous with feeling; but taken strictly, it means "a state of feeling which, while it does not spring directly from an affection of body, manifests its existence and character by some sensible effect upon the body." According to Halleck, "an emotion is the complex agreeable or disagreeable side of any complete mental state, while feeling is the simple agreeable or disagreeable side of any mental activity. . . . Emotion, like perception, is a more complex and complete mental state, and it demands the presence of a representative idea to guide and prolong it. On the other hand, feeling may arise from a bodily cause and may be preceded or accompanied by no distinct idea. Feeling is present in all emotional states. It is a thread on which all other states are strung like beads. When representative ideas appear, the feeling in combination with them

produces emotion."* We shall, however, use the terms interchangeably in these pages.

The term "feeling" is used in several different senses: first, denoting *sensation*, as when I touch a piece of marble and it feels cold, smooth, hard, etc.; secondly, a *mixed bodily feeling*, e. g., the sense of comfort, weariness, being ill at ease, etc.; thirdly, *pleasure and pain;* fourthly, the *aesthetic feeling* of beauty and harmony, as when I observe a rose and experience a sense of *beauty*, or when I hear fine music and experience a sense of *harmony;* fifthly, the *moral feeling*, namely, that of duty, ought, approbation, remorse, etc.

From the variety of terminology employed, we may infer that the subject matter of this division of psychology is somewhat vague and indefinite. And we also find it so when we study the nature of the phenomena here classified. The feelings are in fact the most vague and elusive of all mental phenomena. Every person is conscious of feeling, but no one can determine exactly the nature of this mental state. The feelings occupy a region of psychic life which is as yet largely unexplored. The difference between the feelings and the phenomena of intellect is broad and sharply marked. When I hold a rose in my hand and experience delight from its beauty and fragrance, my consciousness testifies that the feeling I have is not identical with my perception and knowledge of the rose. So when I gaze upon a beautiful picture, my percepts and concepts of the picture are not the same as the feelings which these awaken in my mind. Or, when I listen to fine music, my knowledge of the music is one thing and the feelings of which I am con-

* Halleck, "Psychology and Psychic Life."

scious are something quite different. The percepts, retents, and concepts implied in knowledge are altogether different from the feelings which always accompany knowledge and depend on knowledge. Knowledge is the antecedent state and feeling the consequent state of mental activity; without perception and conception there is no feeling; so, on the other hand, there is never an act of perception and conception unless it be accompanied by some kind of feeling.

The various views held by writers on the subject may be grouped under three general theories:

First, the Physiological Theory. This theory holds that what we call feeling is simply a peculiar consciousness of the condition or state of the nervous system, that the feelings are wholly nervous states; not only that the feelings depend on nervous state, but are identical with these nervous states. This theory appears in many forms. Some hold that feeling comes from concord between the stimulus and the vital activity, namely, that pleasurable feelings arise from agreement, and painful, from disagreement or opposition. Others hold that painful feeling results from overstimulation of the nervous organism. Still others claim that pleasure attends the healthy action of the organs within the limits and powers of repair, i. e., that disagreeable taste, unpleasant contrast of colors, discord in sounds, remorse of conscience, etc., arise whenever the waste of nerve substance is greater than the repair!

But surely these theories are not satisfactory. We want our love of kindred and friends to be deeper and more permanent than the ever changing nerve-cells. We believe that the feeling of beauty and the sweet delight of concordant sounds is something more than

the equable supply of repair material in the brain-cells. We have the firm conviction that our sense of *ought*, our feeling of approval when we do right and of disapproval or condemnation when we do wrong, our reverence and love of God, our holy joy from the knowledge of forgiven sins and the adoption of grace, the pleasures of the communion of saints—that all these sacred emotions of our moral and religious life are more than the normal stimulation of the nervous organism or the healthy action of the organs within the limits of recuperation.

Secondly, the Herbartian or Ideational Theory. This stands in sharp contrast to the several forms of physiological theories. It claims that feelings are dependent on the relations of ideas. It agrees with the physiological theories in making the feelings secondary states of mind, but differs in that it derives these states from *ideas* and not from *nervous action.* It makes a sharp distinction between *sensation* and *feeling:* to the former belong hunger, thirst, weariness, shivering, etc.; to the latter, sympathy, love, gratitude, reverence, etc. Those states of consciousness which are grouped under *sensations* are due to nervous action, while those under the *feelings* result from ideas.

Freely stated, the principal points in this theory are as follows: Feelings in general are either pleasurable or painful. Of whatever kind they may be, they result from the reciprocal action of *ideas* or *concepts.* In the stream of consciousness ideas continually come and go. Every moment new concepts enter and old ones are displaced; but the old concepts "do not yield without exerting an opposition which depends upon their own strength or intensity, and upon

the strength of their reenforcing or assisting concepts." Therefore, there arises in our consciousness a constant *arrest* and *furthering*. If these are weak and transitory, they pass unnoticed. If ideas *interfere* one with another, or *arrest* each other, or *inhibit* each other, the fact of such interference or inhibition gives rise to a feeling of *pain;* if they *agree* together, or *further* each other, the result is *pleasure*. Hence, feeling is defined as "the consciousness of a furthering or an arrest of the movement of thought: when a furthering, a feeling of pleasure; when an arrest, a feeling of pain."*

As has been pointed out before, the life of the soul is a concept life. Throughout our psychic life concepts come and go, that is, they rise above and sink beneath the threshold of consciousness. In this continuous flux of concepts is to be found the cause and spring of our emotional life. Feeling is thus not an isolated activity of the soul; the feelings exist in and with concepts, and without concepts they are nothing. Every emotion has its origin in the concept-mass. Therefore, the greater our concept-mass, the richer our stock of ideas, the broader our experience, and so on, the greater will be our capacity for feeling, and the higher will be the quality of our feeling. "Feeling and cognition are psychological correlatives, existing only in coexistence."

The reciprocal action of concepts, rising and falling, coming and going, furthering and arresting is a matter of daily experience.

Suppose I am writing a poem, composing an oratorio, painting a picture, building a cathedral, constructing a railroad, managing a bank or dry

* Lindner, "Empirical Psychology."

goods house, or doing anything else in the whole round of human employment, the feelings which I experience in the midst of my work are a history of the conflict of concepts, some circumstances furthering and others arresting my concepts as they were struggling upward out of my subjective ideal world into objective realization; and parallel and coincident with this history of the conflict of concepts is also a history of pleasure and pain, satisfaction and disappointment, joy and sorrow.

The Herbartian theory in the main represents the *facts* about the feelings and emotions quite correctly. With a few modifications, which, however, are of considerable importance, we may accept it as a convenient theory, bearing in mind at the same time that it is only a *theory*, since nothing final as yet is known concerning the essential nature of this class of mental phenomena.

Thirdly, Feeling as Original and Underived. According to a third theory, feeling is not derived, on the one hand, from processes of nervous action, nor on the other hand, from processes of furthering or arresting concepts, i. e., *ideation;* but it is an original and underived form of consciousness, as thought itself is original and underived. A definition of what feeling is can come only from having felt the feeling, just as a definition of thought can rest only on actual experience of the thinking act. "Feeling," says Prof. Ladd, "is a primitive and underived mode of the operation of conscious mind."

Such, then, are the three classes of theories in regard to the nature of the feelings. Each of them has strong elements of truth, but no one has all the truth. We may mention a few facts, which we regard as fun-

damental, whatever the theory we accept. Whenever there is any mental action, no matter of what kind or of what degree, there is always a certain feeling accompanying the act of thought. There is also some proportion between the intensity of thought and that of the attendant feeling. This would seem to suggest that there is a causal connection between thought and feeling; and the more probable view is that the thought causes the feeling, and not feeling the thought. Contrary to the assumptions of the physiological theory, we have no hesitancy in affirming that feeling depends on and is conditioned in, concepts. The knowledge of the fact that I have lost my fortune, my reputation, my friend, causes the feeling of sadness, and therefore I weep; the experience, i. e., the known fact, of meeting the dangerous bear causes the feeling of fear, and therefore I run; the concept of the ruffian insulting me causes the feeling of anger, and therefore I strike. In all these cases the cognitive act is antecedent; from that results the feeling; and then follows the bodily action.

General Characteristics. Five general characteristics or marks of the feelings are distinguished, namely, *Content*, *Tone*, *Intensity*, *Rhythm*, and *Duration*. These distinctions are useful mainly for purposes of anlysis and study.

By *Content* we mean the *kind* or *quality* of the feeling, that is, whether bitter, sweet, sour; whether that of anger, avarice, hate, joy, grief, love, patriotism, approbation, remorse; whether an effect produced by a major chord or a minor chord, by a dark gray or a dull brown or a bright red color, etc. Not all the feelings can be thus qualitatively analyzed, since many of them arise from obscure concepts. In gen-

eral, the *quality* of feelings will be sharply marked in proportion as the concepts which produce them are clear and distinct.

By *Tone* of feeling is meant whether the feeling is agreeable or disagreeable, pleasurable or painful. The question has arisen and is sharply debated whether there are some feelings which are neutral as to tone, that is, neither agreeable nor disagreeable—feelings at zero point in the scale of tonicity. Prof. Wundt argues in favor of the existence of such a neutral class. Another author says, "Painful feelings shade *toward* pleasurable feelings, by less and less degrees of pain, and pleasurable feelings shade *away* from the least observably painful, by greater and greater degrees of pleasure." If so, then there must be a point where the feelings are *neutral* in tone. It appears that both the physiological and the ideational aspects of feeling favor this view, and that consciousness adds its testimony on this side of the question. It is possible that there may be sub-conscious feelings, just as there is a flow of concepts below the threshold of consciousness!

Intensity means the quantity or *degree* of feeling, in other words, the *strength* of feeling. We are conscious of different degrees of pain or pleasure, joy or grief, love or hate. All the various feelings may be of low intensity, or they may rise into the height and strength of passions. A given musical chord, which under ordinary circumstances gives rise to a quiet even flow of pleasurable emotion, may under certain circumstances cause in the mind of the hearer a state of rapture, a very frenzy of delight. According to the Herbartian theory, the *intensity* of feeling depends upon the liveliness of promotion and expression, the

intensity of opposing and furthering concepts. "The most intense feelings arise when the most numerous and most powerful furthering concepts meet with the most numerous and most powerful opposing concepts."

By *Rhythm* of the feelings we mean the alternating character of pain and pleasure, grief and joy, etc. As in all other modes of mental activity, so also in the feelings we observe the time-form; all our mental states appear in consciousness with a well marked periodicity. Sudden elevation of the feelings is followed by excessive depression. The rhythmical flow of feeling is but one instance of the universal law of rhythm in nature. Philosophers have pointed out that all motion is rhythmical or wave-like. In every rivulet, as in the course of every great river, the bends of the stream from side to side throughout its tortuous course constitute a lateral undulation—an undulation so inevitable that even an artificially straightened channel is eventually changed into a serpentine one. The surface of the earth is undulatory,—a mountain here, a valley there. The sound which results from drawing a bow across the violin strings, or from forcing a volume of air into the organ-pipe, or from striking a bell, is produced by undulations in the agitated body and transmitted thence to the ear by wave-like movements in the air or other elastic medium. Light and heat from the sun come to us in undulations. The Aurora Borealis is observed to pulsate with alternating waves of greater or less degree of brightness. The planets, satellites, and comets afford us an illustration on a grand scale of this law of rhythmical movement. No wonder that the ancients conceived of the "music of the spheres."

The tides of the ocean flow and ebb. The seasons of the year, the alternation of day and night, succeed each other in rhythmical order. The blood in the body is propelled not in a uniform current but in pulses caused by systole and diastole of the heart; and it is aerated by lungs which alternately expand and contract with every inhalation and exhalation of breath. Human life, physical, social, and religious follows the wave-like form of movement. History is rhythmical—periods of activity follow those of rest as spring follows winter, business prosperity is followed by a season of crisis, reformation succeeds religious stagnation, missionary zeal gives way to indifference. The same oscillatory movement is observed in all our mental states. The action of thought is not uniform but within a given period passes through varying intervals of increasing and decreasing intensity. The current of mental energy as seen in the outflow of emotion into poetry, music, and their corresponding movements of body and voice, is not continuous, but falls into a succession of pulses. Poetry is a form of expression which results when the emphasis is regularly recurrent, accented and unaccented syllables following in orderly succession.

Music, in still more various ways, exemplifies the law. There are the recurring bars, in each of which there is a primary and a secondary beat. There is the alternate increase and decrease of muscular strain, implied by the ascents and descents to the higher and lower notes — ascents and descents composed of smaller waves, breaking the rises and falls of the larger ones, in a mode peculiar to each melody. And then we have, further, the alternation of *piano* and

forte passages. That these several kinds of rhythm, characterizing aesthetic expression, are not, in the common sense of the word, artificial, but are intenser forms of an undulatory movement habitually generated by feeling in its bodily discharge, is shown by the fact that they are all traceable in ordinary speech, which in every sentence has its primary and secondary emphasis, and its cadence containing a chief rise and fall complicated with subordinate rises and falls; and which is accompanied by a more or less oscillatory action of the limbs when the emotion is great. Pain having its origin in bodily disorder, is nearly always perceptibly rhythmical. During hours in which it never actually ceases, it has its variations of intensity—fits of paroxysms; and then after these hours of suffering there usually come hours of comparative ease. Moral pain has the like smaller and larger waves. One possessed by intense grief does not utter continuous moans, or shed tears with an equable rapidity; but these signs of passion come in recurring bursts. Then after a time during which such stronger and weaker waves of emotion alternate, there comes a calm—a time of comparative deadness; to which again succeeds another interval, when dull sorrow rises afresh into acute anguish, with its series of paroxysms. Similarly in great delight, especially as manifested by children who have its display less under control, there are visible variations in the intensity of feeling shown—fits of laughter and dancing about, separated by pauses in which smiles and other slight manifestations of pleasure suffice to discharge the lessened excitement. Nor are there wanting evidences of mental undulations greater in length than any of these—undulations which take weeks, or

months, or years, to complete themselves. Men have their moods which recur at intervals. Very many persons have their epochs of vivacity and depression. There are periods of industry following periods of idleness; and times at which particular subjects or tastes are cultivated with zeal, alternating with times at which they are neglected.*

Dr. Thaddeus L. Bolton of Clark University, a friend and former pupil of the author, has investigated experimentally the subject of "Rhythm" and has published in pamphlet form the results of his researches. Many interesting facts concerning rhythm are here brought out, especially in their relation to music and the general world of aesthetics. This experimenter finds that Rhythm is "the manifestation or the form of the most fundamental activities of mind;"** that the accents and cadences of music and poetry are the natural, inevitable results of this law of rhythm according to which thought and feeling express themselves.

The fifth and last characteristic of the feelings is *Duration,* by which is meant the length of time a feeling lasts. Some feelings are short-lived, while others continue a longer period. The duration depends upon the character of the concepts which give rise to the particular feeling. Sensations we know are very intense while they last, but their power ceases with the sense-impression. Joy, sorrow, hope, love, which have their origin in sentient experience are transient in their nature. Much more lasting are those feelings which have their seat, not in immediate sense impressions, but in extensive, widely branching, and deeply

* Spencer, "First Principles."

** See "Amer. Jour. Psych.," 1893, VI, 214.

involved groups of concepts. Human affection which springs solely from the fascination of enticing outward appearances, such as physical beauty, a fine physique, graceful manners, elegant dress, a sweet voice, captivating smiles, and the like, all of which appeal to the senses, is apt to be superficial in character and of short duration. Personal attractions which are only skin-deep will soon fade away, or even worse, may be succeeded by a positive aversion. Love, to be permanent, must be grounded in concepts of personal worth, of character—concepts, which have for their substance the admirable qualities of the inner soul-life. So the joy and zeal of a religious profession which rests only upon the outward sentient phases of religion, will soon spend their force and lapse into a state of apathy or even scepticism. A Christian profession, in order to be lasting and fruitful, must have its root deep down in a widely branching, extensive concept-system of sound doctrine and of intelligent personal experience.

The pleasure which the lighter kinds of music yield —music, which is brilliant and fascinating and ravishing, which intoxicates the senses, which consists in sound *only*—soon passes away and leaves behind an aching void, perhaps a feeling of disgust. It is sad that in our day the light, fantastic, rattling kind of music which appeals only to the senses, has found a place in our sacred songs and church hymns, to the exclusion in many cases of those solid old melodies and chorals and minor tunes which are solemn and deep and lift the soul of the worshiper into sweet communion with the Heavenly Father. The former, like bodily stimulants, excite the lower sentient feelings, which soon pass away and leave a morbid crav-

ing for greater stimulation: the latter edify the soul and bring lasting joy and comfort. This is not a cry of the "old fogy" against the innovations of progress, but it is the earnest voice of all lovers of good music and of true worship against the frivolities and abuses of the sense-intoxicated present.

Classification of the Feelings. Many plans and schemes of classification have been suggested. All of them have some value. For all purposes the following scheme is deemed most suitable, namely, the Sensuous, the Intellectual, the Aesthetic, and the Moral feelings.

It is to be remarked that these divisions are not absolute, and in the nature of the case cannot be. There are gradations of feeling, and consequently they cannot be sharply limited to any one subdivision of any scheme of classification. The different kinds of feelings shade off into each other by imperceptible degrees. The sensuous cannot be wholly separated from the aesthetic; the bare sensation of sound, for example, cannot be entirely dissociated from the higher sense of harmony, so also the sensation of colors cannot be isolated from the feeling of beauty. Even the moral feelings are mixed more or less with the other feelings which have a bodily basis and origin; for example, love involves both the bodily and the spiritual elements.

Some feelings depend on the condition of the nervous system to such a degree that we may call them *instinctive*. Prof. James Mark Baldwin says: "Nervous reactions become organized in subconscious motor intuitions; mental reactions become organized in perceptions, subconscious beliefs, and interests; so emotions take on mentally subconscious forms.

They become so habitual as to be unremarked except when some new occasion calls them out in the shape of emotional excitement."* To this sub-class may be referred all cases of so-called "objectless emotions." The acts here referred to rest on feelings which have for their origin sub-conscious concepts. It is to be further remarked that our adopted scheme of classification rests on the nature of the concepts which give rise respectively to the several kinds of feeling.

The Sensuous Feelings. To the *sensuous* class belong all those feelings which are connected with the various sensations. They have a strong affinity to the mere bodily sensations from which it is sometimes difficult to distinguish them. "Those sensations of the higher senses having the most positive tone, as those of color and sound, are in themselves accompanied by sensuous feelings. The pleasure in the sense of sight reveals itself in the pleasure we take in light and color, while darkness and imperfect colors are accompanied by unpleasant feelings. The moderate light of day, the mild light of the full moon, the soft light of the heavens, as also the gleam of illuminations, the splendor of fireworks, awaken in man the pleasure in light, whereas the darkness of the night and of the prison cell lies heavy upon the soul."—Lindner. So the pleasure in light and color is analogous to that which we experience in tone and sound. Stillness depresses like darkness; full, pure, prolonged tones affect us like full, rich colors. In all kinds of sensations there is an attendant feeling, which, though closely connected with the sensation, is yet different from the sensation.

* Baldwin, "Elements of Psychology."

The Intellectual Feelings. The *Intellectual* feelings are those which are connected with the activities of judgment, reflection, and reasoning. They are such as accompany the development of our mental faculties, the growth of our convictions, the acquisition of new facts, the progress of scientific knowledge. The feeling of pleasure and satisfaction we experience in the solution of a difficult problem is an illustration familiar to all. It was this feeling that caused the old philosopher Archimedes, pondering upon the problem of the golden crown, when the truth flashed into his mind, to leap out of the bath tub, and, in a frenzy of delight, rush through the streets crying "Eureka! Eureka!" It is this feeling of pleasure incident to the discovery of new things, that has urged the explorers and discoverers of all ages to risk their lives, their all, in the effort to add to the known some facts wrested from the realms of the unknown. It is the love of truth that stimulates the philosopher, the scientist, the historian to deny the vulgar pleasures of sense that they may enrich the world's storehouse of knowledge with the rare treasures of thought and labor.

There was, probably, not a happier moment in Newton's life than when he had succeeded in demonstrating that the same power which caused the apple to fall, held the moon and the planets in their orbits. When Watt discovered that steam might be harnessed like a horse; when an inventor succeeds in perfecting a labor-lightening device; whenever an obscurity is cleared away, the reason for a thing understood, and a baffling instance brought under the general law,—intellectual emotion results."

When Kepler finished the calculations which

brought clearly into view the third of his celebrated laws, it is said that such was the transport with which this discovery, which for 17 years had baffled all his skill and patience, filled him, that he burst into tears and marked the day and year, May 15, 1618, when this great truth became known to him. The composition of his book, "The Harmonies of the World," he tells us yielded more pleasure than all its readers together could experience in its perusal. In the last pages of the book the genius of the inspired dreamer awakens suddenly from the dry details of facts to dictate to him those bold and august expressions which have become not less immortal than the discovery which they herald, and which disclose to us the high feelings that possessed his soul in the midst of labors:

"Eight months since I had a glimpse of the first ray of light; six months since I saw the dawn; a few days ago only did the sun arise in its transcendent glory. I give myself up to my enthusiasm, and venture to brave my fellow-mortals by the ingenuous avowal that I have stolen the golden vessels of the Egyptians in order to raise a tabernacle to my God far from the confines of Egypt. If I am pardoned I shall rejoice at it; if it is made a reproach to me I shall bear it; the die is cast. I write my book, whether it be read by the present age or by posterity imports little; it may well await a reader; has not God waited six thousand years for an observer of his works?"

Our Saviour says: "A woman when she is in travail hath sorrow, because her hour is come: but as soon as she is delivered of the child, she remembereth no more the anguish, for joy that a man is born into the world." So when by travail and by anguish of soul a

great truth is born into the world of science, the memory of past sorrows and labors is swallowed up in the abundance of joy.

The poet Keats in beautiful terms describes his emotions on the discovery of new literary treasures:

> "Then felt I like some watcher of the skies
> When a new planet swims into his ken."

So the following example from Wordsworth shows how the intellectual emotions accompany in a high degree the study of poetry:

> "I have seen
> A curious child, who dwelt upon a tract
> Of inland ground, applying to his ear
> The convolutions of a smooth-lipped shell:
> To which, in silence hushed, his very soul
> Listened intensely—and his countenance soon
> Brightened with joy; for murmurings from within
> Were heard, sonorous cadences! whereby,
> To his belief, the monitor expressed
> Mysterious union with its native sea.
> Even such a shell the universe itself
> Is to the ear of Faith."
>
> —*The Excursion*, Bk. IV.

The Aesthetic Feelings. The *Aesthetic* feelings are those which are awakened by the perception of the beautiful. We posit an aesthetic faculty, that is, a distinct mode of perceptive and conceptive mental activity, whose particular function it is to discern and appreciate the beautiful in art and nature. This faculty, like the other faculties, has its appropriate feeling attendant upon its activity, and this we call the aesthetic feeling. Wundt and others distinguish between the *lower* and the *higher* aesthetic emotion; meaning by the former that which is connected with the more sensuous experience and is almost wholly

formal, while the latter includes the more representative experiences, as having *meaning*.

The Aesthetic feelings have certain characteristics by which they are sharply distinguished from other feelings. They consist in the unconditioned valuation of an object, that is, for the sake of its intrinsic merits, arising from its direct apprehension by the senses, and free from the subordinate external interests, which announces itself as pleasure in the beautiful or displeasure in the ugly. They are thus the least selfish of all the emotions.

They are further distinguished from the simply agreeable and disagreeable by the fact that they do not depend upon the content of the *individual*, but upon the form of the *composite*. A single note sounded by itself may be agreeable, but when sounded with others so as to make a musical chord the effect is beautiful, and is felt to be quite different from that produced by individual tones. The beauty of the magnificent cathedral at Cologne does not consist in the individual stones, pieces of timber, glass, etc., of which it is made, nor in a single column, arch, or window, though pleasing in themselves; it consists rather in the orderly arrangement of all the parts into one harmonious whole. The beauty of the rose does not consist in the color or shape of the petals, but in the combination of its parts. The beauty of the landscape is not in single trees, or shrubs, or rocks or bodies of water, but in the happy grouping of them all according to recognized principles of art. So with the picture, the statue, the poem; the aesthetic effect depends upon the form of the composite whole.

This bringing together of individual things into

one whole, this agreement among the manifold, this concord of the different, we call *harmony*. Harmony is, therefore, the ground principle of the aesthetic feeling. "Since the simple is everywhere aesthetically indifferent, relations must form the object of aesthetic preference or rejection; with tones it is the relation of the numbers expressing their vibrations which decides regarding their harmony or discord. The simpler this relation, e. g., the octave (vibrations 1:2), the more easily is the harmony perceived, the more complete is the agreement." But the simplest relation, as in the case of the octave of a given note, does not yield the highest degree of aesthetic pleasure. Hence, a writer observes, "when tones which are originally discordant are brought together in an accord, or where different chords are blended into greater totality of tone, this reconciliation of differences is especially apparent. This explains the resolution of dissonance in a piece of music, as well as the harmonizing of conflict in that species of the beautiful which is called the tragic."

It may be further remarked that the enjoyment of aesthetic pleasure is not restricted to one or two persons; neither are the objects which awaken the aesthetic feeling the exclusive possession of the favored few—they are open to the whole human race. A picture or a statue may be seen by millions, and the beauty is in no wise impaired or lessened; a great poem reaches all that understand the language in which it is written, and many more; a fine melody may spread pleasure over the habitable globe; the sunset and the stars are veiled only from the prisoner and the blind.

And the world of beauty is not confined to art gal-

leries and libraries and concert halls. Nature in her visible forms everywhere is beautiful and invites the admiration of all. The mountains and valleys, the forests and streams, the starry heavens, the crystals of the grotto, the sculpture of the snow-flake, the tracery of the forest, the richly tinted autumn leaves, the flowers of the garden and meadow, the plumage of the birds, the vari-colored insects,—wherever we go, wherever we look, the great world of beauty lies spread out before our gaze and appeals to our sense of the aesthetic. And then, what a grand concert hall is nature! Not alone the 'music of the spheres' as they go singing in their orbits, but music from every source steals into the ear of the attentive listener—the sweet music of the feathered songsters, the deep organ tones of the ocean and the tempest, the silvery notes of the dancing rivulet, the majestic sound of the waterfall, the awful sub-bass of the thunder peal, the plaintive sighing of the breezes—music everywhere in the great world of harmony.

> "There's not the smallest orb which thou behold'st
> But in his motion like an angel sings,
> Still quiring to the young-eyed cherubims,
> Such harmony is in immortal souls,
> But whilst this muddy vesture of decay
> Doth grossly close it in, we cannot hear it."
>
> —*Merchant of Venice*, Act V.

Several elements enter into aesthetic enjoyment, namely, the sensuous, the intellectual, and the associative. The *sensuous* relates to the experience of pleasure from the direct action of colors or sounds upon their respective nerves without the intervention of thought. Pleasure follows immediately upon the perception of beautiful objects. This does not mean,

however, that the feeling of pleasure arises in such cases independent of concepts, but simply that the concepts are not distinctly in consciousness, as is the case in all thought processes. Some have thought that the aesthetic delights which come from hearing music are largely due to the fact that "harmony gratifies certain simple sensibilities of the nerves of the ear." There may be truth in this hypothesis, but certainly it is a very low kind of musical pleasure which comes from such a source.

The *intellectual* element in aesthethic pleasure is that which thought or knowledge contributes. When I view a picture or hear a piece of music and have accurate knowledge concerning it—know all about its author, its history, its design, its thought-contents—I experience a higher kind of pleasure than when I am ignorant of it. A highly cultured audience has a keener enjoyment of the best music than a rude or uncultured one. This is one reason why classic music is not more appreciated by the average hearer, and why the rustic sees nothing attractive in a collection of fine paintings—these things do not appeal to his feelings because his intelligence does not rise to the plain in which the noble ideas were conceived. Raise the tone of art-intelligence in the popular mind, and the popular audience will appreciate the higher class of music.

The *associative* element is that which comes from the association of ideas or objects or experiences with the thing that is the immediate cause of aesthetic pleasure. This principle has been fully developed in the chapter on Association, and so needs but little more here. There we saw how the stream of our ideas is a series of connected concepts, any one of which

may bring back to consciousness all the rest. Not only are *ideas* associated; *feelings* are also associated with ideas and with one another. We gave examples to show the power of music and stated that the explanation of this wonderful power was to be found in the principle of association. We are now prepared to understand that statement in its fuller scope. Associated ideas give rise to associated feelings, and these feelings are the springs of action, both in the lower nerve-centers and in the higher will.

Mr. Longfellow says: "Of all the rivers of this beautiful earth, there is none so beautiful as the Rhine. There is hardly a league of its whole course, from its cradle in the snowy Alps to its grave in the sands of Holland, which boasts not its peculiar charms." And what is it that gives this river its 'peculiar charms'? The scenery is beautiful and picturesque in the extreme, with here a high jutting crag and there a deep gorge, or receding narrow valley, with its quaint little cities and its vine-clad slopes, with its meandering stream and its castle-crowned rock walls. But far more than all these, it is the interesting legends and stories and the historical events associated with these old castles and rocks and towns that make this river so charming among the rivers of the earth. The castle of *Ingelheim* with its legend of Emma and Eginhard; the *Rheinstein* with its thrilling romance of Sigfrid and Gerda; the little village of *Kaub* with its historical memory as the place where Field-Marshal Blücher on New-year's eve, 1813, began to cross the Rhine in order, as he relates, "to wash out the disgrace of bondage in this proud stream;" *Gutenfels* with its story of Guta and King Richard of Cornwall; *Sternberg* and *Liebenstein* with their pathetic legend

of the two Brothers and Minna; the stronghold of *Stolzenfels* with its wonderful tales of ghosts and witchcraft and the story of Elsbeth; *Ahrenfels*, and the *Drachenfels;* classic old *Bonn*, with its renowned university; *Cologne* with its wonderful cathedral; *Worms* with its Luther-Monument and its memory of "Here I stand, I cannot otherwise; God help me. Amen!"—these and a thousand other associations rush upon the thought of the delighted traveler as he floats along upon the waters of this famous river. When we witness a performance of Wagner's *Rheingold* it adds beauty and interest to the wonderful composition if in imagination we can repeople the old castles with their figures of chivalry and live in the midst of the scenes so grandly described in words and tones.

And so everywhere else,—our aesthetic feelings are greatly elevated and intensified when the objects which excite them are associated with historical truths or legendary tales, with pictures and statues, with buildings and men, with poems and songs.

The aesthetic feelings in a special sense constitute the enchanted regions where live all artists and whence flows the stream of art-productions. It is sacred ground, where low and vulgar things are altogether out of place and out of harmony. The pure love of the beautiful is near akin to the high moral and the divine. It is occupied with lofty things, with things which must be spiritually discerned, with the unseen. It has been well said that "he who sees nothing in a picture but the painted canvas has not seen the picture." So he who hears in a grand piece of music nothing but sound, hears not the music. As one justly remarks:—

"If truth presupposes a pure, unprejudiced, dispassionate state of mind for its apprehension, this is demanded in a still higher degree in the case of beauty; for, the essential elements of the beautiful, with which it overflows, is a feeling, that is, a state of mind; but objective beauty cannot mirror itself in a mind that is excited with passion. The beautiful, like the divine, presupposes a devout frame of mind, a purified heart which approaches its altar. The uncultured mind seizes the object, in order to make it a means for the satisfaction of desires; it is not the form, but the material of the object which is preferred. Aesthetic apprehension leaves the object untouched which it approaches, only with the higher senses in silent devotion."*

And Goethe with fine discrimination says, "Man does not desire the stars—he rejoices in their beauty."

To this may be added the familiar lines of Shakespeare:—

> "The man that hath no music in himself,
> Nor is not moved with concord of sweet sounds,
> Is fit for treasons, stratagems, and spoils;
> The motions of his spirit are dull as night,
> And his affections dark as Erebus.
> Let no such man be trusted."
>
> —*Merchant of Venice*, Act V.

The Moral Feelings. The *moral* feelings are those which are connected with the concepts of right and wrong, good and evil, duty and religion—in a word, with the functions of conscience. They hold the highest rank and dominate the most important interests of the human race. They are invested with a sense of authority which no other kind of feeling possesses.

*Lindner, "Empirical Psychology."

"Thou shalt" and "thou shalt not," are the words of authority and of inviolable law which go forth with the moral emotions; in proportion as these solemn imperatives are obeyed or disobeyed, we experience peace or condemnation. There is no such feeling of authority or necessity in any other class of emotions. The *true* does not bind us, the *beautiful* has no power to compel choice and action; the *good* alone is invested with authority. "The perception of a rainbow, a ruined castle or autumnal scenery may raise an aesthetic feeling but never a moral one. Lear could blame the winds for buffeting his old and helpless head only after he had personifed them . . . We may admire a painting or a cathedral or not, just as we choose; if we fail to admire, remorse does not follow." Not so with the perception of moral qualities; we cannot be indifferent to the good and the right, to duty and God.

Cultivation of the Feelings. Just as the muscles of the body and the powers of thought may be cultivated, so can the feelings be improved and controlled by proper exercise. The feelings are like habits—they become strengthened and fixed by oft-repeated and persistent use. Indeed, a feeling of joy or despondency, of benevolence or hate, of gratitude or selfishness, if fostered may become second nature, that is, habitual. It is an error to suppose that a man's disposition is altogether native to him, something given him once for all, to keep and make the best of it. Our dispositions as well as our minds are capable of indefinite improvement by culture.

This fact rests on the same physiological basis as do the phenomena of habit, memory, and association. Experiment shows and experience confirms the state-

ment that our nerves as well as our muscles improve with exercise. It is a matter of record that nerves have improved in discriminating power, whether in reference to sound, colors, taste, touch, or odors. This subject of late years has received very much attention in the psychological laboratory and some positive results have been attained in regard to the reaction-time of nerves. By *reaction-time* is meant the very small period of time which elapses between the application of a stimulus to a given nerve and the reaction of that nerve or the production of motion in its correlative muscles, in other words, the time required for the nervous discharge and its conversion into muscular motion. By numerous experiments it is found that the reaction-time varies in different individuals and in the same individual under different circumstances. In old people and in uncultivated people the time is long (nearly a second, in an old pauper observed by Exner); in children also before the work of training has proceeded far, the time is comparatively long. *Practice* has the effect to shorten the time of reaction; so also the *concentration of attention.* Fatigue, intoxicants, disuse lengthen it. The reaction-time for the sound-stimulus is shorter than for either sight or touch. Tones of different intensities show no change in the average reaction-time; but as the *pitch* rises the time decreases, a fact which as yet has not been satisfactorily explained.*

What do these experiments prove? Clearly, that nerves are improved by exercise, that their native sensitiveness to stimuli may be increased by right usage and lessened by neglect or abuse. The signifi-

*Scripture, "The New Psychology," p. 144.

cance of this truth cannot be too strongly emphasized as a basis for the cultivation of the feelings.

In nothing does the degree of culture attained by our aesthetic emotions announce itself so infallibly as in our *taste*. "The vulgar," says Grant Allen, "are pleased by great masses of color, especially red, orange, and purple, which give their coarse nervous organization the requisite stimulus. The refined, with nerves of less caliber, but greater discriminativeness, require delicate combinations of complementaries and prefer neutral tints to the glare of the primary hues. Children and savages love to dress in all the colors of the rainbow. . . Good taste is the progressive product of progressing fineness and discrimination in the nerves, educated attention, high and noble emotional constitution, and increasing intellectual faculties."†

Not only for the sake of acquiring a refined and elevated taste, which should be the possession of every intelligent and cultured person, but also for other reasons should the emotions be cultivated. The enjoyment of the pure pleasures of the senses, enjoyment of the amenities of refined society, enjoyment of the aesthetic delights afforded by music and her sister arts, enjoyment of the higher spiritual felicities of Christian experience,—enjoyment of life, as the Creator designed it, is not possible without the cultivation of our emotional powers.

"Life is not an empty dream.

* * * *

Life is real! Life is earnest!
And the grave is not its goal!"

†Grant Allen, "Physiological Aesthetics."

God meant that the measure of our life's days and years should be filled full with the enjoyment which flows from virtuous actions. He meant that we should be happy here in this world as well as in the world beyond; for this purpose He gave us a soul with capacity for intellectual, aesthetic, and spiritual enjoyment; and for this reason He created this world a beautiful world, that some of its beauty might come into the soul to gladden, to enrich, to elevate its life. The life of feeling, quite as much as that of thought, is a legitimate life, and asceticism is a reproach to our Maker. Education is intended to increase our capacity for happiness as well as our capacity for usefulness, and religion has its fruitage in the realization of those *beatitudes* pronounced by the Saviour of the world upon the pious of all ages. Puritanic fanaticism may banish poetry and musical instruments and innocent amusements from society, the fiery, ill-guided zeal of the iconoclast may break open temples and demolish images and altar pieces, the rude vandal may destroy the treasures of art, but as long as the soul is what it is and nature is nature, so long will the enjoyment of cultivated emotional life be a dominant major in the grand harmony of the world. The highest enjoyment comes from making others happy; that is the *mode* of cultivated, refined feeling, the charity that "is kind, that envieth not, that vaunteth not itself, that is not puffed up, doth not behave itself unseemly, seeketh not its own, is not easily provoked, thinketh no evil."

Cultivation of the feelings is further necessary in order to keep them under proper control. Emotion is a good servant, but a terrible master. The feelings if kept under control and guided aright are a mighty

power for good, but if allowed to run wild they are a dangerous power for evil. *Passion* is ungoverned, violent feeling—it is the high spirited steed, broken loose from restraint; it is the quietly flowing river now swollen, overflowing its banks and wildly rushing; it is the gentle zephyr now fretted into the furious whirlwind; it is the useful steam become explosive and tearing its receptacle into fragments; it is the harmless electric fluid now gathered into the angry thunder cloud hurling its destructive bolts upon the earth. Control these elements, and you make them mighty helpers to human industry and human life; so, control the feelings by education and culture and you make them a potent influence for good, an important adjunct to psychic life.

But you say, I am nervous by constitution or temperament and so cannot control my nerves and emotions. All the greater need of training. The child's fretfulness and peevishness can be overcome, and so can yours. It is a good old maxim, "Think twice before speaking once." Restraining the expression of an excited emotion is ofttimes the best way to subdue it. A fire will go out of its own accord if fuel is not supplied. The words of Prof. James deserve to be heeded: "Refuse to express a passion, and it dies. Count ten before venting your anger, and its occasion seems ridiculous. Whistling to keep up courage is no mere figure of speech. On the other hand, sit all day in a moping posture, sigh, and reply to everything with a dismal voice, and your melancholy lingers. There is no more valuable precept in moral education than this, as all who have experience know: if we wish to conquer undesirable emotional tendencies in ourselves, we must assiduously, and in the first instance

coldbloodedly, go through the *outward movements* of those contrary dispositions which we prefer to cultivate. The reward of persistency will infallibly come, in the fading out of the sullenness or depression, and the advent of real cheerfulness and kindliness in their stead. Smooth the brow, brighten the eye, contract the dorsal rather than the ventral aspect of the frame, and speak in a major key, pass the genial compliment, and your heart must be frigid if it do not gradually thaw!"

"To guard against passion is one of the chief duties of man. He will not easily sink beneath the yoke of passion if accustomed to a moral discipline through early obedience to the commands of parent and teacher, as well as the regulations of society, through strictness and toughening, moderation and abstinence, the avoidance of eccentric pleasures, and above all through yielding to a habit of thought rich in moral ideals."

QUESTIONS.

1. Distinguish '*feeling*' from 'sensation' and 'emotion.'
2. Five different senses in which the word 'feeling' is used?
3. General nature of the feelings? Facts in the case?
4. Explain the *physiological theory* of feeling.
5. What objection to these views?
6. State the theory of Prof. James, and give objection to it.
7. State the *Herbartian* theory.
8. Explain the *furthering* and *arresting* of concepts.
9. *Merits* of the Herbartian theory?
10. State a *third* theory of feeling.
11. Mention some *fundamental facts* in regard to the feelings.
12. What is meant by the *content* of feeling? Illustrate.

13. What is meant by the *tone* of feeling?
14. Are there feelings with *indifferent tone?*
15. Define *intensity* of feeling.
16. On what does intensity *depend?*
17. What is meant by *rhythm* of feeling?
18. Illustrate the *universality* of rhythm in nature.
19. What is said of Bolton's researches in rhythm?
20. Define *duration* of feeling.
21. On what does duration *depend?*
22. What is said of human *affection?*
23. What is said of Christian *steadfastness?*
24. What is said of *light, flashy music?*
25. What is said of *sacred* music?
26. What is said about the *classification* of the feelings? Give adopted scheme.
27. Why cannot the feelings be satisfactorily classified?
28. What about *subconscious* feelings?
29. What are the *sensuous* feelings?
30. Define the *intellectual* feelings. Illustrate.
31. Give example about Kepler.
32. What is said about the birth of new ideas?
33. What are the *aesthetic* feelings?
34. Name some *characteristics* of the aesthetic feelings.
35. Show that the aesthetic feelings depend on *composite form.*
36. What is said of *harmony* in relation to aesthetic emotion?
37. Show that aesthetic pleasure is *not restricted* to the few. Give examples.
38. Name *three elements* in aesthetic enjoyment.
39. Explain the *sensuous* element.
40. What is the *intellectual* element?
41. Define the *associative* element.
42. Show *bearing* of association on feelings.
43. What makes the Rhine so interesting? Illustrate.
44. Explain relation of aesthetic feelings to art.
45. Show *affinity* of the beautiful to the divine.
46. Quote lines from Shakespeare.
47. Define the *moral* feelings.
48. What *distinctive peculiarity* do the moral feelings possess?
49. Why can the feelings be cultivated?
50. On what *basis* rests the cultivation of human disposition?
51. What is meant by *reaction-time?*

52. State results of experiments, and what do these show?
53. What is said of *taste?* Give substance of quotation from Grant Allen.
54. What is said of *enjoyment?*
55. Explain reference to true "*charity*" in this connection.
56. What is said of controlling the feelings?
57. Define *passion*. Illustrate.
58. Can *nerves* be controlled? How?
59. Give reasons why passion should be controlled.

CHAPTER. XI.

The Will.

WILL is the name usually given to the executive faculty of the soul. It makes the third grand division of our psychology, and completes the round of all the known modes of mental activity. An act of will implies choice, motive and execution. In so far as it implies *choice* it rests in a *cognitive* function; in so far as it implies *motive* it rests in an *emotional* function; and on its *executive* side it rests in *motor* function. So then the will as the supreme faculty covers the field both of the concepts and of the feelings; it extends its sway over the entire realm of psychic life. It is royal in its nature and if not dethroned by the anarchistic forces of low animal passions and indulgences, it is seated upon its throne and "by divine right" rules the life of man in simple majesty and order.

The *choice* involved in an act of volition depends on knowledge, The will is, therefore, an intelligent sovereign. There could be no choice between different things or different courses of action if there were not knowledge of the things discriminated. In that beautiful allegory, "The Choice of Hercules," when the young hero stood perplexed at the point where he had to choose one path or the other, he was fully instructed by the two virgins, Virtue and Vice, concerning the nature and goal of their respective paths, and therefore made his choice intelligently. It is a

correct representation of every true choice. In choice there is always knowledge of alternatives and deliberation upon the merits of the things in consciousness. In order that the will may guide to a right and safe goal there must be adequate information; otherwise it will be like the blind leading the blind. If knowledge be lacking volition resolves itself into submission to fate, which goes ever "as weird must go." First, then, as the basis for the development of a resolute and normal will, there must be a liberal supply of concepts, both extensive and intensive knowledge.

The *motive* power of volition is furnished by the feelings. The direction in which the will goes is determined by an *idea*, but the propelling force which urges it on to its goal is *emotion*. It is true, that the emotions themselves, as we have seen, are modified and even controlled by the will; but it is also true that the emotions thus innervated and strengthened, in turn react upon the will to determine its action. If my feelings are indifferent, my will is weak, undecided, wavering. If I cherish no noble ambition, the hope or expectation of whose attainment thrills my soul with an inner delight, my will is not able to surmount the petty obstacles that lie in my way. If the feeling of a worthy purpose does not move your will, you will never become a good musician. Your ardent desires, your earnest longings, your sincere love for your art must fan your will into a flame, and then the little difficulties which obstruct your way will soon be consumed. It is an old saying that "love conquers all things," and also that "a stout heart makes a strong arm." In the light of our subject is disclosed the philosophy of these maxims; we see *how*

'love conquers' and *how* the 'stout heart' innervates the arm for mighty execution.

Our remarks lead us again to the physiological aspect of the subject, namely, to consider how the nervous energy of a high-wrought feeling like water from a reservoir on a high elevation, with great potentiality discharges itself downward into the motor organs. It is an exceedingly fascinating field which the 'new psychology' has opened up to view; but we cannot enter now. Many startling and radical things are said by writers on the subject, but most of them remain to be proved. According to Münsterberg, "The will is only a complex of sensations." If this is a fair specimen of the 'new doctrines,' we prefer to cling to the old until we have better information.

The question concerning the freedom of the will has puzzled the minds of philosophers from the earliest days, and it is not yet settled in all its aspects. But in the light of the best philosophy and the best science of to-day there is no good reason for doubting that the will of man, in the right sense of the word, *is free.* When the physiological aspects of the problem are cleared up it will be found that the facts which appear to militate against the doctrine of freedom really do not belong to the will proper. The determinism of reflex action is not the determinism of will.

We must assume that the choices and decisions of man are free, that is, they are his own unconstrained acts, otherwise we have no foundation for character. If I am not the author of my acts, then I am not responsible for them; then the administration of moral law and civil law is lawlessness, Moral law and civil law imply accountability, and accountability implies freedom to choose and act. We do not forget the

influence of heredity and environment in shaping character; but eliminate these, and the great central factor remains. A man cannot choose his parents; heredity is a powerful factor; but it is a matter of common observation that a man by the power of his will can deeply modify and in many instances entirely overcome the appetites and tendencies which he has received from his parents. If a son has in his nature the taint of a hereditary fondness for drink, it does not follow that he *must* be and *will* be a drunkard; he has a power within him which by proper cultivation is able to overcome the hereditary leaning. We believe that resisting the devil, overcoming temptation, and such like phrases in the language of religion and morals are more than mere figures of speech. They are solid facts, and they have their foundation in psychological principles.

Environment is a powerful factor in shaping character; we have remarked concerning it in the chapter on association, and we see it daily illustrated. But it is also true, in the first place, that a man can to a great extent determine his environment, and, in the second place, that he can materially modify his existing environment. On the authority of experience and the authority of God's word any man, by the grace of God, can *be* what he *ought* to be, an honest, upright, industrious, temperate, law-abiding, pious, Christian man. The fact argues the sovereignty of will and sovereignty implies freedom.

The will, like all other faculties, is capable of cultivation. Not all men are gifted alike in respect to will power; not every man is a Napoleon. But whatever a man's endowment, he can improve it indefinitely. The child's will is undeveloped, capricious, and

lawless; it needs to have its potency developed and guided and controlled. A large share in the business of education has to do with will training. To control the child's will power and to enlist it in the work of mental development is the teacher's first strategic point. And in mature life it is a prominent duty of everyone to attend to the culturing of his will. The cultivation of will consists not alone in developing strength, but also in directing its energy in the proper channel, in keeping it under proper control, and in coordinating it in a normal manner with the various other elements of psychic life.

What has been given in the chapter on habit by way of rules for the formation of right habits is applicable here by way of suggestion as to the cultivation of the will. We have also in another place spoken of the possibilities of the will in practical life and of its influences on states of body and mind, and therefore this subject needs nothing further here. In our brief remarks in this chapter on the will we have but hinted at a few things from the midst of a great and broad field upon which volumes have been written, and which our brief space forbids us to unfold.

QUESTIONS.

1. Meaning of *will?*
2. What is implied in an act of will?
3. Explain the sovereign nature of will.
4. On what does *choice* depend? Illustrate.
5. What is the *motive power* of volition?

6. Show influence of the emotions on will?
7. Explain physiological aspect of the will.
8. What is said of new theories?
9. What is said of the *freedom* of the will.
10. Explain *moral* bearing of freedom of the will.
11. Explain influence of *environment*.
12. What of *cultivation* of will?

THE END.

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